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## **DOCTORAL THESIS**

**Exploring dietetics workforce preparation and preparedness in Australia.**

Morgan, Kate

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# BOND UNIVERSITY

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## **Exploring dietetics workforce preparation and preparedness in Australia**

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A thesis submitted in fulfilment of the degree of Doctor of Philosophy (PhD)

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## **Abstract**

Producing dietitians who are suitably prepared to practice is essential to ensuring the effectiveness of the dietetics profession, and the health of those that the dietetics workforce serves. Given the increasing international burden of diet-related disease and the clear role that nutrition plays in optimising health, the emerging dietetics workforce is ideally-placed to advance future global health. Dietetics workforce preparation and preparedness are inextricably linked phenomena. Existing evidence regarding these phenomena generally focuses on specific aspects and is often limited to single settings. Further, the overall experiences and challenges faced by key stakeholders embedded in these phenomena have been largely unexplored. This lack of scholarship limits dietetics workforce planning and development efforts. This thesis aimed to address this by exploring dietetics workforce preparation and preparedness in Australia.

Multiple approaches were taken in this thesis to review and generate evidence relevant to the phenomena of interest. A systematic mapping review documented existing dietetics education research conducted in Australia and informed the development and implementation of subsequent studies (Chapter 2). A national, cross-sectional survey enumerated and profiled the professional attributes of the academic dietetics educator workforce in Australia (Chapter 4). Following this, a series of three qualitative studies explored the experiences of, and challenges faced by, key stakeholders from across Australia including academic dietetics educators (Chapter 5), dietetics practice educators (Chapter 6) and recent dietetics graduates (Chapter 7). In-depth, semi-structured interviews obtained richly-detailed insights from these key stakeholders and thematic analysis incorporating multiple researcher perspectives was employed to develop themes across the data sets. Finally, a systematic review and qualitative synthesis of dietetics students' experiences of workforce preparation and preparedness was

conducted to add depth and comprehensiveness to the key stakeholder perspectives already provided (Chapter 8).

While each study in this thesis generated results and revealed insights into dietetics workforce preparation and preparedness, the key findings synthesized from across all studies included that: there is a significant lack of data on the emerging (and existing) dietetics workforce in Australia; key stakeholders involved in dietetics workforce preparation and preparedness in Australia are motivated by altruistic intentions and a desire to do ‘good’ work; there is a misalignment between what dietetics graduates in Australia are being prepared for and what they need to be prepared for; the systems in which Australian dietetics workforce preparation stakeholders operate, constrain and impact their ability to optimally perform their roles; key stakeholders involved in dietetics workforce preparation and preparedness in Australia value support that enables them to fulfil their aspirations and do quality work; and a lack of collaboration and collegiality exists within the profession.

This thesis has produced a body of nationally-relevant evidence around dietetics workforce preparation and preparedness in Australia and provides impetus for conducting similar research in other countries and other health professions. It has revealed that key stakeholders embedded in the phenomena face numerous challenges which are exacerbated by a lack of robust workforce data. Strategies that ensure dietetics workforce preparation is well-aligned with contemporary and future practice needs are required. Mechanisms that harness the collective motivation of, provide support for, and incentivize collaboration between, all key stakeholders in dietetics workforce preparation are needed for the benefit of emerging workforce and the entire profession. Further, a strategic and coordinated approach to collecting and disseminating data on the dietetics workforce is essential to inform dietetics workforce planning and to ensuring that the dietetics workforce of the future is relevant and responsive.

## **Keywords**

Dietetics

Education

Educators

Graduates

Placement

Preparation

Preparedness

Students

University

Workforce

## **Declaration by candidate**

This thesis is submitted to Bond University in fulfilment of the requirements of the degree of Doctor of Philosophy (PhD). This thesis contains my own original work towards this research degree and contains no material that has previously been submitted for a degree or diploma at this University or any other institution, except where due acknowledgement is made.

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Name: Kate Morgan, PhD Candidate

Signed:

Date: 11 May 2019

## Declaration of author contributions & ethical approvals

Thesis chapter	Publication co-authored	Statement of contribution	Ethical approval no*.
2	Morgan, K, Kelly, J, Campbell, KL, Hughes, R, Reidlinger, DP, Dietetics workforce preparation and preparedness in Australia: A systematic mapping review to inform future dietetics education research. <i>Nutrition &amp; Dietetics</i> 2018, 76: 47-56.	Conceptualisation & design: KM, KC, RH Data collection: KM, JK, KC, DR Data analysis: KM, JK Manuscript drafting: KM, JK, KC, DR Manuscript review: KM, JK, KC, DR, RH	N/A
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6	Morgan, K, Campbell, KL, Sargeant, S, Reidlinger, DP. Preparing our future workforce: a qualitative exploration of dietetics practice educators' experiences. <i>Journal of Human Nutrition and Dietetics</i> 2018, 32: 247-258.	Conceptualisation & design: KM, KC, DR Data collection: KM, KC, SS Data analysis: KM, DR, SS Manuscript drafting: KM, DR, KC, SS Manuscript review: KM, DR, KC, SS	RO1948
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\*The research associated with this thesis received ethical approval from the Bond University Human Research Ethics Committee (BUHREC).



## Research outputs arising from this thesis

The following outputs were published or presented from the research conducted as part of this thesis.

### Peer-reviewed journal publications (original research)

(Chapter 2)

1. **Morgan, K**, Kelly, J, Campbell, KL, Hughes, R, Reidlinger, DP. Dietetics workforce preparation and preparedness in Australia: A systematic mapping review to inform future dietetics education research. *Nutrition & Dietetics* 2018, 76: 47-56.  
<https://doi.org/10.1111/1747-0080.12450>

(Chapter 4)

2. **Morgan, K**, Hughes, R. Professional attributes of the emerging academic dietetics educator workforce in Australia. *Nutrition & Dietetics* 2016, **73**: 275-282.  
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(Chapter 5)

3. **Morgan, K**, Reidlinger, DP, Sargeant, S, Crane, L, Campbell, KL. Challenges in preparing the dietetics workforce of the future: An exploration of dietetics educators' experiences. *Nutrition & Dietetics* 2018. <https://doi.org/10.1111/1747-0080.12438>  
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(Chapter 6)

4. **Morgan, K**, Campbell, KL, Sargeant, S, Reidlinger, DP. Preparing our future workforce: a qualitative exploration of dietetics practice educators' experiences. *Journal of Human Nutrition and Dietetics* 2018, 32: 247-258.  
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(Chapter 8)

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(Chapter 7)

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### **Peer-reviewed journal publications (abstracts)**

1. **Morgan, K**, Hughes, R. Who Is Preparing Our Dietitians of the Future? A Professional Profile of the Dietetics Educator Workforce in Australia. *Journal of the Academy of Nutrition and Dietetics* 2015, 115 (Suppl. 2): A10.  
<https://doi.org/10.1016/j.jand.2015.06.020>
2. **Morgan, K**, Hughes, R, Campbell, KL, Sargeant, S, Crane, L. Preparing the workforce of the future: perspectives of academic dietetics educators in Australian universities. *Nutrition & Dietetics* 2016, 73 (Suppl. 1): 51-97.  
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1. **Morgan, K**, Hughes, R. Does the dietetics educator workforce have enough meat on its bones? A professional profile of the dietetics educators preparing Australia's future dietitians. Services for Australian Rural and Remote Allied Health (SARRAH), 2014: Kingscliff, Australia

## Conference presentations (posters)

1. **Morgan, K**, Campbell, KL, Reidlinger, DP. Dietetics students' experiences of dietetics workforce preparation and preparedness: a systematic review and qualitative synthesis. International Institute for Qualitative Methodology Qualitative Methods Conference, 2019: Brisbane, Australia.
2. **Morgan, K**, Hughes, R, Campbell, KL, Crane, L, Sargeant, S. Preparing the workforce of the future: perspectives of academic dietetics educators in Australian universities. Dietitians Association of Australia (DAA) National Conference, 2016: Melbourne, Australia.
3. **Morgan, K**, Hughes, R. Who Is Preparing Our Dietitians of the Future? A Professional Profile of the Dietetics Educator Workforce in Australia. Food and Nutrition Conference and Expo (FNCE) of the Academy of Nutrition and Dietetics, 2015: Nashville, USA.
4. **Morgan, K**, Hughes, R. Who Is Preparing Our Dietitians of the Future? A Professional Profile of the Dietetics Educator Workforce in Australia. Bond University Higher Degree by Research Conference, 2015: Gold Coast, Australia.
5. **Morgan, K**, Hughes, R. A professional profile of the dietetics educators preparing Australia's future dietitians. Gold Coast Health and Medical Research Conference, 2014: Gold Coast, Australia.
6. **Morgan, K**, Hughes, R. Does the dietetics educator workforce have enough meat on its bones? A professional profile of the dietetics educators preparing Australia's future dietitians. Australian & New Zealand Association of Health Professional Educators (ANZAHPE), 2014: Gold Coast, Australia.

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## Abbreviations

ADC	Australian Dietetics Council
AND	Academy of Nutrition and Dietetics
APD	Accredited Practising Dietitian
AWPA	Australian Workforce Productivity Agency
BDA	British Dietetic Association
DAA	Dietitians Association of Australia
DC	Dietitians of Canada
DCC	Dietetics Credentialing Council
ENTREQ	Enhancing transparency in reporting the synthesis of qualitative research
HWA	Health Workforce Australia
ICDA	International Confederation of Dietetics Associations
NHMRC	National Health and Medical Research Council
PROSPERO	International prospective register of systematic reviews
RATS	Qualitative research review guidelines – RATS (Relevance, Appropriateness, Transparency, Soundness)
SPSS	Statistical Package for the Social Sciences
SRQR	Standards for Reporting Qualitative Research
UK	United Kingdom
USA	United States of America
WHO	World Health Organization

## **Chapter 1.     Introduction**

## **1.1. Preface**

This chapter provides a description of the phenomena under investigation – dietetics workforce preparation and preparedness. It also highlights the significance of the emerging dietetics workforce in contributing to the advancement of global health. Attributes of the dietetics workforce and the dietetics workforce preparation system in Australia are described, and associated evidence gaps are highlighted to provide context and rationale for the research conducted in this thesis.

## **1.2. Health workforce preparation and preparedness**

An effective health workforce is critical to improving health outcomes globally, as recognized by the World Health Organization.<sup>1</sup> Preparing a health workforce that is fit-to-practice and fit-for-purpose is an international priority.<sup>2</sup> While this task represents an important opportunity, it also presents significant challenges.<sup>2</sup> It is well-recognised that the landscape within which health care operates is constantly evolving and increasingly challenging. As demographic, technological and globalisation mega-trends converge to significantly impact all work environments,<sup>3</sup> stakeholders in health care are further impacted by increasing levels of chronic disease, rising costs and heightened consumer expectations.<sup>4,5</sup> Further, the move towards demand-driven higher education and student-as-consumer approach has resulted in a reoriented focus on enhancing student satisfaction and heightened competition between universities.<sup>6-8</sup> The responsiveness of health workforce preparation has been criticized internationally with scholars stating that “Professional education has not kept pace with these challenges, largely because of fragmented, outdated, and static curricula that produce ill-equipped graduates.”<sup>9</sup> (p1923) In an effort to address the abovementioned factors, health workforce preparation has been the subject of international and national calls for reform.<sup>1,2,4,10</sup>

### **1.2.1. Defining health workforce preparation**

In the absence of a universally-recognised definition, health workforce preparation can be described as the formal process of equipping individuals with the requisite attributes to independently practise as a health professional. It is also referred to as health professions education and/or training in the literature.<sup>2,11</sup> In addition, the stage prior to students completing their preparation and becoming a qualified health professional may be referred to as pre-registration, pre-licensure or pre-qualification.<sup>11-13</sup> A key objective of health workforce preparation is “to underpin the efficient and effective delivery of health services by providing the appropriate number and mix of health workers, equipped with the right skills and competencies.”<sup>14(p68)</sup> Or, as stated by the WHO, it is about “giving the right training to the right people to create an effective workforce for the delivery of health care.”<sup>2(p41)</sup>

While health workforce preparation differs according to discipline, contexts and countries, it generally requires immersing students in a structured, competency-based education and training program. This usually involves the development of knowledge and skills in university settings (e.g. lectures, workshops) along with the application and assessment of competence in workplace settings (e.g. professional placements). Competency-based education involves an approach to training health professionals through outcome-focused programs and activities that develop graduate competencies.<sup>15</sup> Additionally, competence is defined as bringing together an array of abilities to perform in a certain context.<sup>15</sup>

Workforce preparation is a core component of workforce development. Workforce development has been described as “the strategic investment of resources by organisations and communities in activities that...enable and promote effective practices...of the workforce for more effective...outcomes.”<sup>16(p24)</sup> It requires the active planning, education and management of the health workforce to deliver effective health outcomes.<sup>2,17</sup>



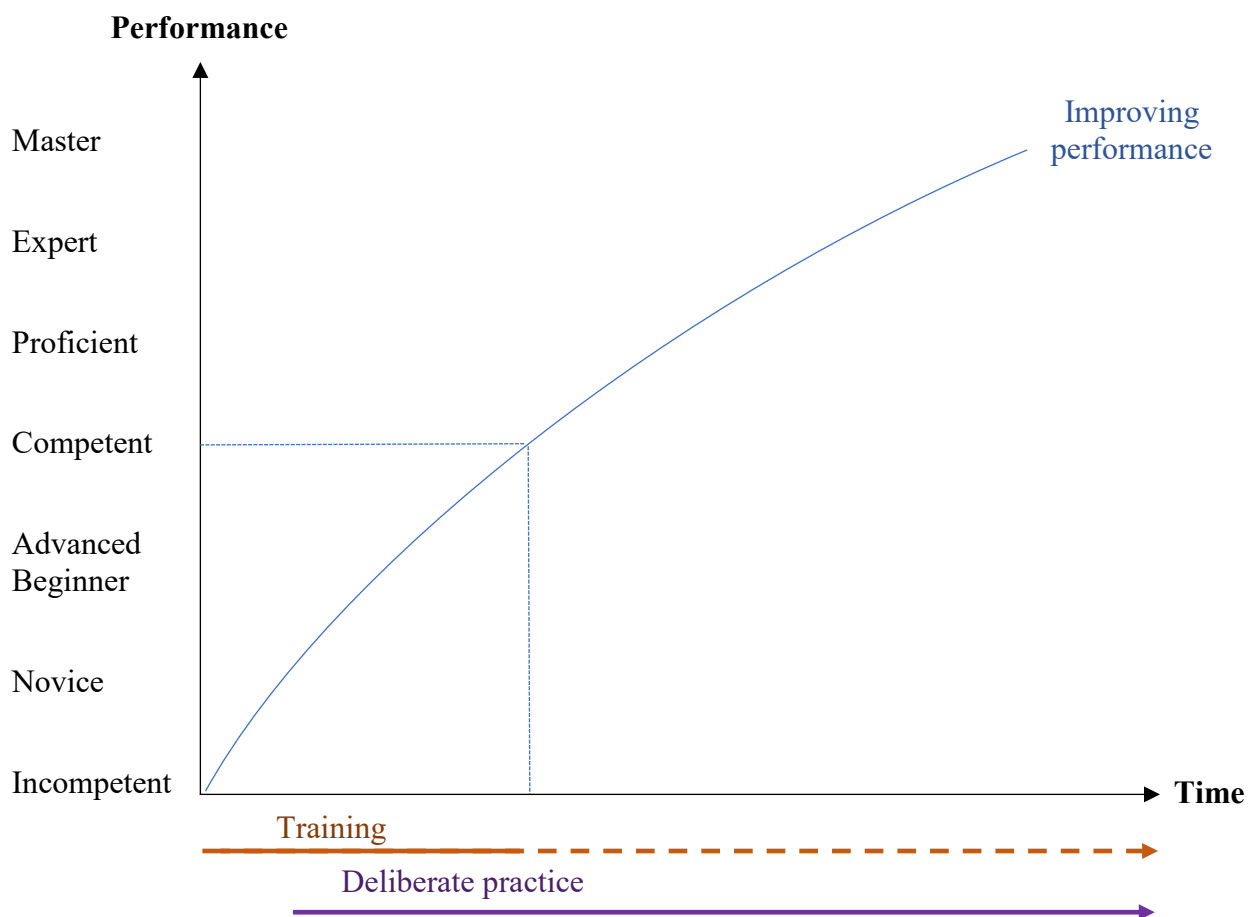
### **1.2.2. Defining health workforce preparedness**

The phenomenon of workforce preparation is inextricably linked to the phenomenon of workforce preparedness. Workforce preparedness can be likened to the concept of being ‘competent’. Similar to competence,<sup>18</sup> preparedness should be viewed as a continuous, non-linear process.<sup>19</sup> It is proposed that preparedness should not be interpreted as an absolute and final ‘point’ that all health professional students/graduates will reach by the completion of their education program. Rather, students/graduates may become prepared for different contexts at different stages of their training. Further, preparedness may describe an ongoing process of learning, adapting and developing in the ever-changing health care environment.<sup>19</sup> However, for the purpose of this thesis, health workforce preparedness refers to how prepared graduates are to enter the workforce as a health professional upon graduation. In the literature, workforce preparedness is also referred to as work-readiness, preparedness to practice and preparedness for practice.<sup>20-22</sup>

### **1.2.3. Conceptualising health workforce preparation and preparedness**

Preparing health professionals for the workforce involves progressing students through stages of professional growth. Through training and deliberate practice (practice with the intent of developing competence), these individuals acquire skills and develop competence over time.<sup>18</sup> According to the curve of improving performance in healthcare by Khan and Ramachandran (Figure 1-1), students enter their formal education programs as ‘incompetent’ before becoming a ‘novice’. Through training and deliberate practice, they then progress to the ‘advanced beginner’ stage and move towards being ‘competent.’<sup>18</sup> Transitioning between stages along the professional development spectrum can present challenges for the health professional students/graduates involved. In particular, the stage between completing an education program and entering the workforce has been noted as one in which individuals

experience ‘transition shock’.<sup>23</sup> An earlier model, specifically designed for dietetics and adapted from the original Dreyfus and Dreyfus model,<sup>24</sup> indicated that the curve between being ‘competent’ and ‘proficient’ (as graduates entered the workforce) was steep.<sup>25,26</sup> These models have been used to conceptualise the phenomena of dietetics workforce preparation and preparedness in this thesis. Also, for the purpose of this thesis, preparation includes the stages of and between ‘incompetent’ and ‘competent’ while preparedness refers to the transition between ‘competent’ and ‘proficient’. The development and demonstration of competence in dietetics workforce preparation is further discussed in Section 1.5.



**Figure 1-1** Curve of improving performance in healthcare, adapted from Khan and Ramachandran (2012)<sup>18</sup>

#### **1.2.4. Scholarship regarding health workforce preparation and preparedness**

The volume of health professions' education literature is increasingly vast.<sup>27</sup> In Australia, the largest health professions (by number of registered practitioners) are nursing, medicine, oral health practitioners followed by pharmacists, psychologists, social workers and physiotherapists.<sup>28</sup> It is reasonable to assume that the body of published scholarship regarding workforce preparation and preparedness for those well-established professions is considerably greater than for those health professions which are relatively new and small (e.g. dietetics). While learnings can be taken from existing scholarship regarding the preparation of certain health workforces and applied to others, profession-specific education research is required to better prepare students to address future health challenges.<sup>29</sup>

If workforce preparation is conceptualised as the stages between and including 'incompetent' and 'competent' (as per Section 1.2.3), the volume of existing scholarship regarding all aspects of health workforce preparation across all health professions is considerable. Such research often focuses on the implementation and evaluation of a specific aspects of health workforce preparation as opposed to exploring the phenomenon broadly. For example, researchers aim to evaluate the effectiveness of a particular learning and teaching strategy rather than evaluating the overall effectiveness of the health workforce preparation process. In regards to exploring the perspectives of key stakeholders embedded in health workforce preparation and preparedness, preliminary investigations have indicated that academic educators are the least researched group, followed by the practice educators. A larger body of evidence appears to exist regarding the students' and graduates' being prepared for the health workforce. Specifically, the phenomenon of preparedness to practice has been examined within many health professions including pharmacy,<sup>30</sup> nursing,<sup>31,32</sup> medicine,<sup>33,34</sup> occupational therapy<sup>35,36</sup> and physiotherapy<sup>37,38</sup> as well as across multiple health professions.<sup>39</sup>

### **1.3. Advancing health through nutrition**

Nutrition has long been recognized as an important modifiable determinant in promoting and maintaining health. The World Health Organization (WHO) acknowledges that poor dietary intakes can contribute to the development of adverse health outcomes.<sup>40</sup> Further, the double burden of malnutrition presents a major and growing global challenge, with nearly one in every three people across the world suffering from the effects of either undernutrition or overnutrition.<sup>41</sup> This includes underweight, vitamin and mineral deficiencies, overweight, obesity and diet-related non-communicable diseases such as type 2 diabetes. In addition, emerging evidence has demonstrated an association between nutrition and the development of multimorbidity (the coexistence of two or more chronic conditions in an individual)<sup>42</sup> – a phenomenon which is increasing globally.<sup>43</sup> On the contrary, following evidence-based dietary recommendations can optimise human performance<sup>44</sup> and improve quality of life,<sup>45</sup> while healthy dietary patterns can help prevent and manage many chronic conditions including cardiovascular disease and some forms of cancer.<sup>45</sup>

#### **1.3.1. Burden of malnutrition and multimorbidity**

Estimates on international prevalence of overnutrition indicate that 1.9 billion adults (39%) are overweight and more than 650 million (13%) are obese.<sup>46</sup> As for children and adolescents, more than 340 million (18%) are either overweight or obese.<sup>46</sup> In regards to undernutrition, around 462 million adults (9.5%) are underweight, 264 million women have iron deficiency anaemia and 52 million children suffer from wasting.<sup>41</sup>

In 2012, the Australian Institute of Health and Welfare (AIHW) reported that diet-related chronic diseases were the major cause of death and disability in Australia and that they were increasing in prevalence.<sup>47</sup> More recent data has confirmed that the prevalence of conditions related to overnutrition remains high in Australia. In 2014-15, almost two in every

three (63%) Australian adults were overweight (36%) or obese (28%) and more than one in every four (28%) children (aged 5-17 years) were overweight (20%) or obese (8%).<sup>48,49</sup> Only a third of Australian adults are classified as having a healthy body weight. Conditions related to undernutrition, are also evident in Australia. Indigenous girls (aged 2-14) (8%) were twice as likely to be underweight compared to non-Indigenous girls (4%).<sup>49</sup> Inadequate nutrient intakes are also common with almost three quarters of women not meeting recommended intakes for calcium, almost one quarter not meeting recommended intakes for iron and nearly one in every ten women not meeting iodine requirements.<sup>50</sup>

Overweight and obesity alone are responsible for 7% of the total burden of disease (impact of diseases and risk factors on a population) in Australia and 63% of this burden is due to fatal outcomes (years of life lost due to dying prematurely).<sup>51</sup> In addition to the personal costs of overnutrition, it was estimated that obesity cost the Australian economy \$8.6 billion in 2011-12.<sup>52</sup> If obesity rates are not reduced, this figure could reach \$87.7 billion by 2025.<sup>52</sup> Further, when reduced wellbeing is also accounted for, the yearly cost to the Australian economy is estimated to be around \$120 billion.<sup>53</sup>

The growing burden of multimorbidity is also posing a significant challenge both in Australia and internationally.<sup>43,54</sup> Almost 25% of people in developed countries have been reported as multimorbid,<sup>55,56</sup> whereas prevalence of multimorbidity in low- and middle-income countries has ranged from around 35% to 20% of the population.<sup>57</sup> In Australia, recent estimates have indicated that over 25% of the population have two or more diagnosed chronic conditions.<sup>58</sup> Of these conditions, the most prevalent (hypertension, osteoarthritis and hyperlipidemia)<sup>58</sup> all have established links with poor dietary intakes, including overweight and obesity (which is attributed to, in part, by excessive energy intakes).<sup>49</sup> While the aetiology and management of individuals with two or more chronic conditions is complex,

the association between nutrition and the development of multimorbidity is increasingly recognized.<sup>42</sup>

Preparing an effective health workforce that can advance nutrition-related health is critical to addressing these major public health issues.

### **1.3.2. A well-equipped health workforce**

Addressing the global issues of multimorbidity and malnutrition requires a strategic, coordinated and integrated response. While this includes the combined efforts of many sectors and health professionals,<sup>41</sup> it is health professionals with expertise in nutrition who will be well-placed to affect change. With recognized qualifications and competence to advance health through nutrition, the dietetics workforce should be well-positioned to help address the burden of malnutrition and nutrition-related multimorbidity. As stated by the WHO, enabling the health workforce to address such enormous health challenges and achieve positive health outcomes is about “getting it right at the beginning.”<sup>2(p41)</sup>

## **1.4. The dietetics workforce**

The dietetics workforce is well-placed to address the challenges associated with this major global health issue – the double burden of malnutrition. While the use of diet in the treatment of disease dates back to ancient times, the dietetics profession is relatively new. The first national association of dietitians was established in the USA in 1917,<sup>59</sup> and in Australia, the first state-based dietetics association was established in 1935.<sup>60</sup> In the twenty-first century, the dietetics workforce has experienced significant growth and change. This has been in parallel with rising consumer interest in, and increasing evidence around, the role of nutrition in optimising health. The important contribution that dietitians make in the management of chronic disease has been recognized in Australia. Since 2004, under the government-funded

health care scheme, Medicare, eligible individuals have been able to claim a rebate from services rendered by an Accredited Practising Dietitian (APD)\* for treating chronic health conditions (e.g. cardiovascular disease and diabetes).<sup>61,62</sup> A rise in the number of APDs has been noted since the introduction of this scheme.<sup>63</sup>

#### **1.4.1. Defining dietetics and dietitian**

The internationally-accepted definition of a dietitian\*\* is “a professional who applies the science of food and nutrition to promote health, prevent and treat disease to optimise the health of individuals, groups, communities and populations.”<sup>64</sup> The national dietetics association in Australia defines a dietitian as per the previous internationally-accepted definition.<sup>65</sup> That is, “A dietitian is a person with a qualification in nutrition and dietetics recognised by national authority [s]. The dietitian applies the science of nutrition to the feeding and education of groups of people and individuals in health and disease.”<sup>66</sup>

There is no universally-accepted definition of the term dietetics. In Australia, the profession of dietetics is defined as one that “contributes to the promotion of health and the prevention and treatment of illness by optimising the nutrition of populations, communities and individuals. Dietitians have a defined and recognisable body of knowledge and utilise scientific principles and methods in the study of nutrition and dietetics, applying these results to influence the wider environment affecting food intake and eating behaviour. The scope of dietetic practice is such that dietitians may work in a variety of settings and have a variety of work functions”<sup>66</sup> This is reflected in the USA where dietetics is referred to as “the integration, application, and communication of principles derived from food, nutrition, social, business, and basic sciences, to achieve and maintain optimal nutrition status of individuals through the development, provision, and management of effective food and nutrition services in a variety of settings.”<sup>67</sup>

\*The term Accredited Practising Dietitian (APD) is the official credential recognized in Australia, and is further discussed in section 1.4.6.

\*\*The official internationally-accepted term dietitian-nutritionist accounts for variations of dietetics professionals across different countries. For the purpose of this thesis, the term accepted in Australia, dietitian, is used.

### **1.4.2. The international dietetics workforce**

The International Confederation of Dietetic Associations (ICDA) is a global body of dietitians that was established in 2000. It brings together national dietetics associations from countries including Australia, which represent dietitian members.<sup>68</sup> The ICDA produces regular reports about the international dietetics workforce based on a survey of its member associations. These reports are not a comprehensive view of the dietetics workforce internationally as some national dietetics associations do not submit sufficient data to the ICDA and some dietitians are not members of the national dietetics association in their respective country. In 2016, the ICDA reported data provided by 48 national dietetics associations across 42 countries. While precise numbers cannot be ascertained, the total number of dietitians globally is estimated to be around 520,000. From 2000 to 2016, the number of national dietetics associations grew from 31 to 48 and the number of individual members represented by ICDA grew from 135,000 to 209,362 (both 55% growth).<sup>59</sup>

### **1.4.3. The Australian dietetics workforce**

As acknowledged by a national government authority, there is a lack of good information regarding the dietetics workforce in Australia.<sup>69</sup> The professional dietetics association in Australia, the Dietitians Association of Australia (DAA), represents more than 6,500 dietitian members. However, it is not mandatory for dietitians to be members of the DAA, nor is dietetics a registered profession in Australia. Therefore, it is difficult to establish the exact size or to obtain cross-sectional data on key attributes of the Australian dietetics workforce, such as gender distribution and principal place of practice. Despite this, estimates can be made based on available DAA data and assumptions. Based on the DAA's reported membership of 6,813 in 2017<sup>70</sup> along with the DAA's estimate that it represents 80% of the dietetics workforce,<sup>71</sup> this indicates there could be up to 8,500 dietitians in Australia. This



figure may not be indicative of practising dietitians as DAA membership includes student members, members who are unemployed or not working in nutrition and dietetics, and individuals who have retired.<sup>70</sup> In 2017, there were 4,824 ‘working’ DAA members<sup>70</sup> which could give an additional indication of practising dietitian numbers in Australia. However, this figure excludes practising dietitians who were not DAA members.

Previous attempts to enumerate the size of the dietetics workforce in Australia have also noted difficulties.<sup>69</sup> In 2011, national census data indicated that 6,235 individuals self-reported their highest educational qualification as being in nutrition and dietetics. Of these, 2,832 individuals reported their occupation as being a dietitian and 2,527 reported working in fields not related to their qualification.<sup>69</sup> In the same year, the DAA reported having 3,889 APD\* members. This number could have included APDs working overseas and would have excluded dietitians who were practising in Australia but were not members of the DAA.<sup>69</sup> It has also been identified that the national census data is misleading due to the inclusion of nutritionists along with dietitians<sup>72</sup> and the exclusion of dietitians with higher degrees in other areas (e.g. a PhD in public health).<sup>73</sup>

The Australian dietetics workforce has reportedly experienced significant growth and expansion in recent years. While there is a lack of consistent and robust data to support such statements, estimates can be made from DAA annual reports. These reports indicate that DAA member numbers grew from 1,049 in 1991 to 1,714 in 2001 and then to 6,811 in 2016.<sup>73,74</sup> This substantial increase over a 26-year period suggests a year-on-year growth rate of around 8%. This is congruent with previous estimates that DAA member numbers were increasing at a rate of around 8% per year between 2005 and 2009<sup>60</sup> and between 2007 and 2012.<sup>75</sup> It also indicates a higher year-on-year growth rate of almost 10% so far in the twenty-first century (from 2001 to 2016). Given the aforementioned difficulties and reported

limitations in enumerating the size of the dietetics workforce in Australia,<sup>69,73</sup> these figures should be interpreted with caution.

Apart from reporting on their member numbers, attributes of the dietetics workforce are not published by the DAA. However, a 2014 publication based on national census data reported that the Australian dietetics workforce: is predominately female (~95%); is relatively young (~35 years of age); works part-time (~30 hours per week); holds a bachelor-level degree (~50%); is employed in hospitals (~52%); resides in New South Wales (~32%) and in a major city (79%).<sup>69</sup>

#### **1.4.4. Professional dietetics associations**

Professional dietetics associations represent, support and advocate for their dietitian members in many countries across the world. The Dietitians Association of Australia (DAA) was established in 1976 under the name of the Australian Association of Dietitians. Its mission is to support members, advocate for the profession and build healthier communities.<sup>76</sup> The DAA is governed by a Board of Directors who are supported by the Chief Executive Officer and an Executive Team.<sup>77</sup> Two bodies acting for the DAA are the Australian Dietetics Council (ADC) and the Dietetics Credentialing Council (DCC). The ADC's main function is to provide advice to the Board on matters regarding accreditation and recognition, including the accreditation of university dietetics programs in Australia.<sup>78</sup> The DCC is responsible for regulation and credentialing processes that ensure professional standards and public safety, including overseeing the APD program.<sup>79</sup> Both the ADC and the DCC operate independently of the DAA and are made up primarily of dietitians who are also APDs/DAA members.<sup>78,79</sup>

#### **1.4.5. Regulation of the dietetics profession**

Professional regulation involves the setting and monitoring of standards, both in education and practice, to ensure the protection of the public. According to the ICDA, all National

Dietetics Associations have aspired to registration for many years. Registration acts to ensure members of the public that the dietitian with whom they are dealing is appropriately qualified and competent.<sup>59</sup> As dietetics is not a registered profession in Australia, it is not regulated by the government. Dietetics operates under a system of self-regulation which is managed by the DAA.<sup>80</sup> Most major health professions in Australia are registered under the National Registration and Accreditation Scheme (NRAS). Currently, sixteen health professions are regulated under the National Registration and Accreditation Scheme and governed under national law. These include medicine, nursing, physiotherapy, occupational therapy, podiatry, optometry and Chinese medicine. The National Registration and Accreditation Scheme is implemented by the National Board for each registered profession with the support of the Australian Health Practitioner Regulation Agency (AHPRA).<sup>81,82</sup>

An objective of the NRAS is to ensure public safety by keeping a national register of health practitioners who are suitably trained and qualified to practise in a competent and ethical manner within their relevant profession.<sup>83</sup> Registered professions have access to information such as the size, age and gender makeup of their workforce, as well as the qualifications and principal place of practice of their practitioners. Such information can be used to inform health workforce planning for those member professions.<sup>84</sup> Additionally, registration under the NRAS offers legal title protection for those health professions under the state- and territory-based Health Practitioner Regulation National Law.<sup>85</sup> As a profession that is not registered under the NRAS, dietetics is unable to benefit from the services afforded to registered health professions, including title protection and nationally-consistent, transparent and coordinated data collection. Dietetics has joined with other self-regulated health professions, including audiology, exercise and sports science, and speech pathology, to form the National Alliance of Self Regulating Health Professions (NASRHP) which is a

subgroup of Allied Health Professions Australia (AHPA).<sup>86</sup> The DAA has, in the past, campaigned for registration under the NRAS.<sup>86</sup>

#### **1.4.6. Professional dietetics titles and credentials**

Formally-recognised dietetics credentials differ across countries. For example, the recognised credential in the USA and the UK is Registered Dietitian Nutritionist (RDN) and Registered Dietitian (RD), respectively.<sup>87</sup> In Australia, the term ‘dietitian’ is not legally protected,<sup>88</sup> as dietetics is not a registered profession (as per Section 1.4.5). An individual using that title is therefore not bound by any formal legislation, standards or requirements. However, the recognised credential, Accredited Practising Dietitian (APD), is a trademark protected by law.<sup>89</sup> Developed and managed by the DAA based on the advice of the DCC, the APD credential is intended to provide a guarantee of dietetics expertise to the public and to establish a professional standard of practice for dietitians. Eligibility for dietitians using the APD title is dependent upon individuals graduating from a DAA-accredited university program in Australia and demonstrating both continuing professional development and recency of practice.<sup>90</sup> That is to say, a graduate of a DAA-accredited program is eligible to become a DAA member and an APD. Only dietitians with the APD credential can be formally recognised as service providers by Medicare, the Department of Veterans Affairs and private health insurers.<sup>90</sup> It is not compulsory for dietitians who practice in Australia to be members of the APD program or to be members of the DAA.<sup>91</sup> However, members and APDs are required to abide by professional standards, including a code of professional conduct and statement of ethical practice.<sup>92</sup>

#### **1.4.7. Areas of dietetics practice**

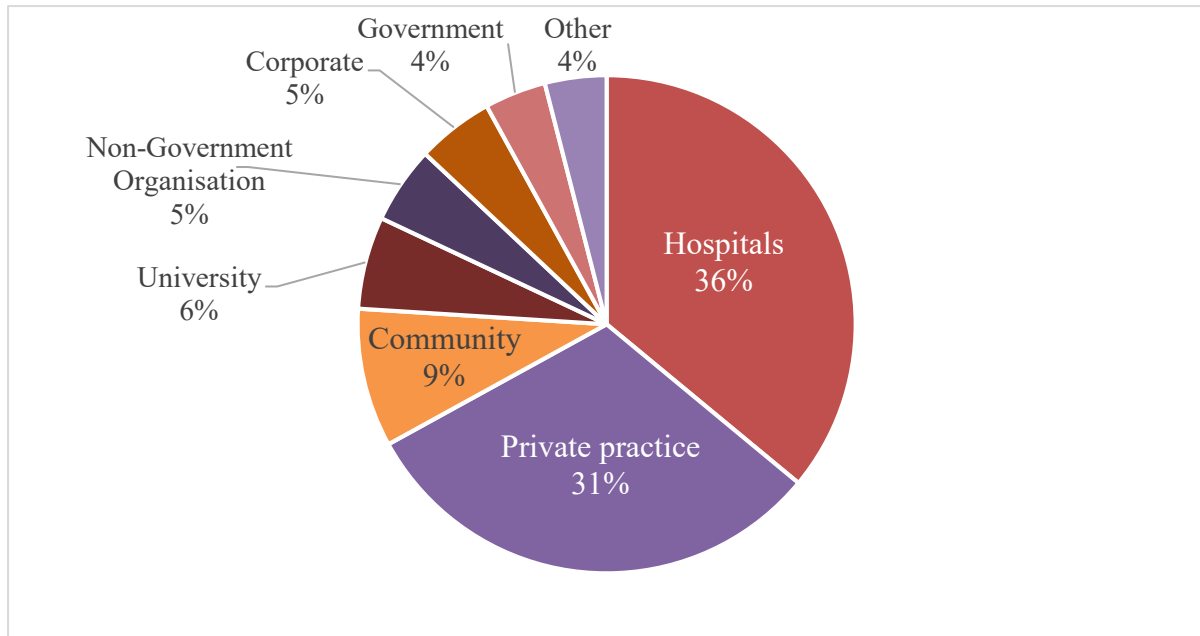
Dietitians work across the world in a wide variety of areas and settings, and these continue to evolve.<sup>59,93</sup> Historically, hospitals have been a major employer of dietitians and all national

dietetics associations report that some proportion of their members still work in hospitals. Some of the other most common areas where dietitians work internationally include food service, academia/research, food production/manufacturing companies and community health centres. Dietitians are least commonly employed in the military and media; however, both of these areas are growing. Private practice, consultancy and self-employment are areas which have experienced apparent growth on an international scale.<sup>59</sup>

In Australia, the DAA collects data on its members' work areas through their annual membership renewal process. However, data on DAA member work areas are not comprehensively or consistently published, nor is this data made available to DAA members. As a result, it is unknown how many dietitians are working in Australia, and in defined areas of practice, at any one time. Despite this lack of data, the DAA state that "The breadth of professional practice being carried out within the dietetic profession in Australia is expanding rapidly. In the past, the majority of dietitians were employed in the hospital sector; many now work in various aspects of the food and nutrition industry."<sup>94(np)</sup> Researchers have attempted to quantify and analyse trends regarding the areas in which dietitians practice in Australia based on data from surveys, censuses and historical DAA annual reports. This information is summarised below.

In 2006, it was reported that the majority (~60%) of dietitians in Australia were employed in the public sector.<sup>60,73</sup> More recent census data has also shown that dietitian employment across the public and private sectors is relatively even.<sup>69</sup> While the majority of dietitians are currently employed outside the hospital setting, according to the DAA hospitals remain the major area in which dietitians work (36%), followed by private practice (31%), community settings (9%) and universities (6%) (Figure 1-2) (P. King, personal communication, 17 September 2018). A 2010 survey of almost 700 DAA members indicated a similar pattern – after hospitals, community nutrition, private practice/consultancy and

research/education were the most predominant areas where Australian dietitians worked. The areas of food service and industry/marketing/public relations were among the least common.<sup>95</sup>



**Figure 1-2** Areas where dietitians work in Australia as at 2017 according to the Dietitians Association of Australia (P. King, personal communication, 17 September 2018)

In addition to considering absolute numbers, analysing trends and changes in dietetics workforce areas is also valuable. While dietitian roles in hospitals have been referred to as ‘traditional’,<sup>96</sup> work settings which are relatively new and have experienced recent growth are often referred to as ‘non-traditional’ or ‘emerging’ areas of practice.<sup>73,96,97</sup> These emerging areas have been cited in recent literature as comprising private practice, food industry and aged care facilities.<sup>96,98,99</sup> Interestingly, a decade earlier, researchers highlighted industry and private practice as the main growth areas for dietitians.<sup>73</sup> In 2005, the DAA reported that private practice was the fastest growing work area for Australian dietitians.<sup>97</sup> Despite a lack of available data to substantiate this apparent trend, other researchers have noted increases in dietitians working in private practice in Australia.<sup>62,63</sup>

In addition to a lack of robust and available data to assess trends in dietetics work areas over time, changes in how dietetics workforce areas are categorised limit longitudinal analyses. For example, international data suggest that ‘academia/research’ may be one of the greatest growth areas in which dietitians work.<sup>59</sup> In Australia, it could be inferred that the proportion of dietitians working in academia grew from 5.0% in 2004 to 7.8% in 2011.<sup>73,100</sup> However, this increase may be a misleading due to the re-categorisation of those areas from ‘educational institution’ to ‘research / education’ by the DAA. Changes to categorisation of work areas in 2005, has previously been noted as artificially increasing growth in some work areas and limiting the ability to make accurate comparisons over time.<sup>62</sup>

## **1.5. Dietetics workforce preparation standards**

As described in Section 1.2.1, dietetics workforce preparation is the formal process of equipping individuals with requisite competence to perform the role of a dietitian. This process is underpinned by standards which aim to produce such competent dietetics graduates.

Processes and standards for preparing dietetics workforces vary according to different countries/regions. The ICDA standard or minimum level for dietetics education internationally is “a bachelor degree in nutrition and dietetics and a period of supervised professional practice of at least 500 hours, which together meet international competency standards for dietitians-nutritionists.”<sup>59(p10)</sup> However, some countries require a Masters level degree as the minimum standard.<sup>59</sup> The length of time required to obtain a degree in dietetics is around 3-5 years (Bachelor) or 2-3 years (Masters). Most countries require students to meet competency standards in order to complete their dietetics education program. This involves students fulfilling a practicum/placement component outside of the university setting. Currently, for most countries this ranges from 11-20 weeks (~440-800 hours) or 21-30 weeks

(~840-1200 hours). Internationally, dietitians in most countries, including recent graduates, are expected to demonstrate continued competence through professional development throughout their working lives.<sup>59</sup>

In Australia, there are two sets of standards for dietetics education programs – accreditation standards (Accreditation Standards for Dietetics Education Programs<sup>101</sup>) and competency standards (National Competency Standards for Dietitians in Australia<sup>102</sup>). These standards are complementary and are used in conjunction as quality assurance and quality improvement mechanisms to protect the public. Both issued by the DAA, they stipulate elements around requisite graduate attributes, students’ professional placement and areas of practice in which competence should be developed.

### **1.5.1. Accreditation standards for preparing dietitians**

The DAA define accreditation as “the process through which a university’s dietetics education program demonstrates that it produces or will produce competent dietitians.”<sup>101</sup>

The current Accreditation Standards for Dietetics Education Programs in Australia were issued by the DAA in 2017. They are designed for universities to demonstrate that their dietetics education program meets a minimum quality standard of education and training to produce competent graduates.<sup>101</sup> The accreditation standards are developed by dietetics researchers in consultation with dietetics stakeholders and are subject to ongoing review.<sup>103</sup>

Broadly, the standards against which dietetics education programs must demonstrate compliance in order to be eligible for accreditation include: 1. Governance; 2. Staffing; 3. Resources; 4. Curriculum; 5. Professional Placement Program; and 6. International Students.<sup>101</sup>

In addition to the DAA, other parties involved in the accreditation process are the Australian Dietetics Council (ADC) and the Accreditation Review Team (ART). The ADC is



responsible for providing advice to the DAA regarding accreditation matters and for appointing the ART members. The ART are responsible for conducting reviews of dietetics education programs, including site visits, in order to assess the program's compliance with accreditation standards. Seeking, gaining and maintaining accreditation is subject to the approval of the DAA, based on the advice of the ADC and the ART and requires the payment of fees by the university. Once accreditation has been awarded, the process for universities to maintain their accredited status is ongoing and includes annual reporting.<sup>103</sup>

Dietetics education programs use the accreditation standards in conjunction with competency standards to produce competent graduates (as outlined in Section 1.5). Under Standard 4. Curriculum, universities are required to demonstrate how the program curriculum enables students to meet the competency standards.<sup>101</sup> Students develop competence by participating in a range of activities which typically take place in universities and practice settings. These practice settings are no longer prescribed in the current competency standards. However, previously students were required to complete a minimum number of weeks' placement in the areas of individual case management, food service management and community and public health nutrition settings.<sup>104,105</sup> Despite the current standards undergoing a "major revision" that was "in line with emerging changes" for health professions,<sup>101,106</sup> they state that the professional placement program should include opportunities for students to demonstrate competence in the similarly described areas of medical nutrition therapy, food service systems and public health nutrition.<sup>101</sup> Further, while the previous accreditation standards stated that "innovation is encouraged" in regards to student placement settings,<sup>105</sup> this has been removed from the current standards.<sup>101</sup>

In regards to professional placement program duration, the current accreditation standards stipulate that students must be provided with a minimum 100 days in a work setting / practice area.<sup>101</sup> The previous standards similarly required 20 weeks or 100 days of

placement to be completed.<sup>105</sup> Based on a typical work day of 7.5-8 hours or a typical work week of 37.5-40 hours, this new standard is equivalent to a minimum of 750-800 hours of placement in practice settings.

Graduates of DAA-accredited programs, who have therefore satisfied the requirements of the abovementioned competency and accreditation standards, are eligible to become a DAA member and an Accredited Practising Dietitian (APD).<sup>103</sup> A profile of DAA-accredited programs in Australia is described in Section 1.6.2.

### **1.5.2. Competency standards for preparing dietitians**

The current National Competency Standards for Dietitians in Australia are “statements that describe the function of a dietitian in Australia”<sup>107(p9)</sup> and were issued in 2015.<sup>102</sup> They are intended for use by universities to develop curricula and associated activities that comply with accreditation standards, and to demonstrate how those curricula and activities produce competent graduates.<sup>102</sup> The competency standards comprise four domains (major work roles) which are: 1. Practises professionally; 2. Positively influences the health of individuals, groups and/or populations to achieve nutrition outcomes; 3. Applies critical thinking and integrates evidence into practice; and 4. Collaborates with clients and stakeholders. Within these domains are 13 key tasks/elements (activities performed within the domains) which are expanded into 55 observable and/or measurable actions (statements of how the task would be evaluated).<sup>96,102</sup> Together, these domains, elements and observable actions describe the work role of a dietitian in Australia.<sup>107</sup>

Prior to the current iteration, competency standards for dietitians in Australia were first published in 1993 and underwent three subsequent reviews in 1998, 2005 and 2009.<sup>96</sup> The 2009 competency standards also comprised fifty-eight elements outlining what dietitians needed to do to fulfil those nine units or work roles and 166 performance criteria, indicating

the level of performance expected for each element.<sup>104</sup> Reducing the number of elements and performance criteria required to demonstrate competence is consistent with contemporary approaches to competency-based education. Taking a broad-based approach to preparing generalists who can apply their skills across many settings is recognised as a potential solution for responding to future population health needs.<sup>96,108</sup>

In line with the curve of improving performance described in Section 1.2.3, students enrolled in dietetics education programs undertake a range of activities which enable them to develop competence over time. It is the responsibility of the universities to design, develop and implement such activities which enable students to meet the competency standards. The university is also responsible for the assessment of each individual students' competence against the competency standards. While competence is often assessed prior to the point of entry into the workforce or for 'entry-level' dietitians, the competency standards also describe the minimum performance of all dietitians in the workforce.<sup>107</sup>

### **1.5.3. Continued competence of dietitians**

Following graduation from a dietetics program, a health professional's competence typically develops further as they progress along the curve of improving performance.<sup>18</sup> As outlined in Figure 1-1, with deliberate practice experience in the workplace, the practitioner generally moves towards becoming Proficient and the subsequent stages of Expert and Master.<sup>18</sup> In Australia, as is the case in most countries,<sup>59</sup> dietitians are required to demonstrate how they are developing professionally and continuing to maintain competence. This is achieved through the Accredited Practising Dietitian (APD) program.<sup>90</sup>

Following completion of a dietetics education program, graduates who elect to participate in the APD program undertake an initial year as a Provisional APD. During this 52-week period, the Provisional APD must log a minimum of 30 hours of Continuing

Professional Development (CPD) activities and must have the support of an APD with whom they are engaged in a formalised mentoring partnership. The role of the APD is to mentor and facilitate the Provisional APD towards achieving specified development goals and learning outcomes. Following sign-off by the APD and approval by the DAA, the Provisional APD can progress to full APD status.<sup>109</sup> Dietitians who choose not to participate in the APD program are not required to satisfy the requirements of the program. However, they may participate in other professional development activities and programs.

## **1.6. Dietetics workforce preparation system attributes**

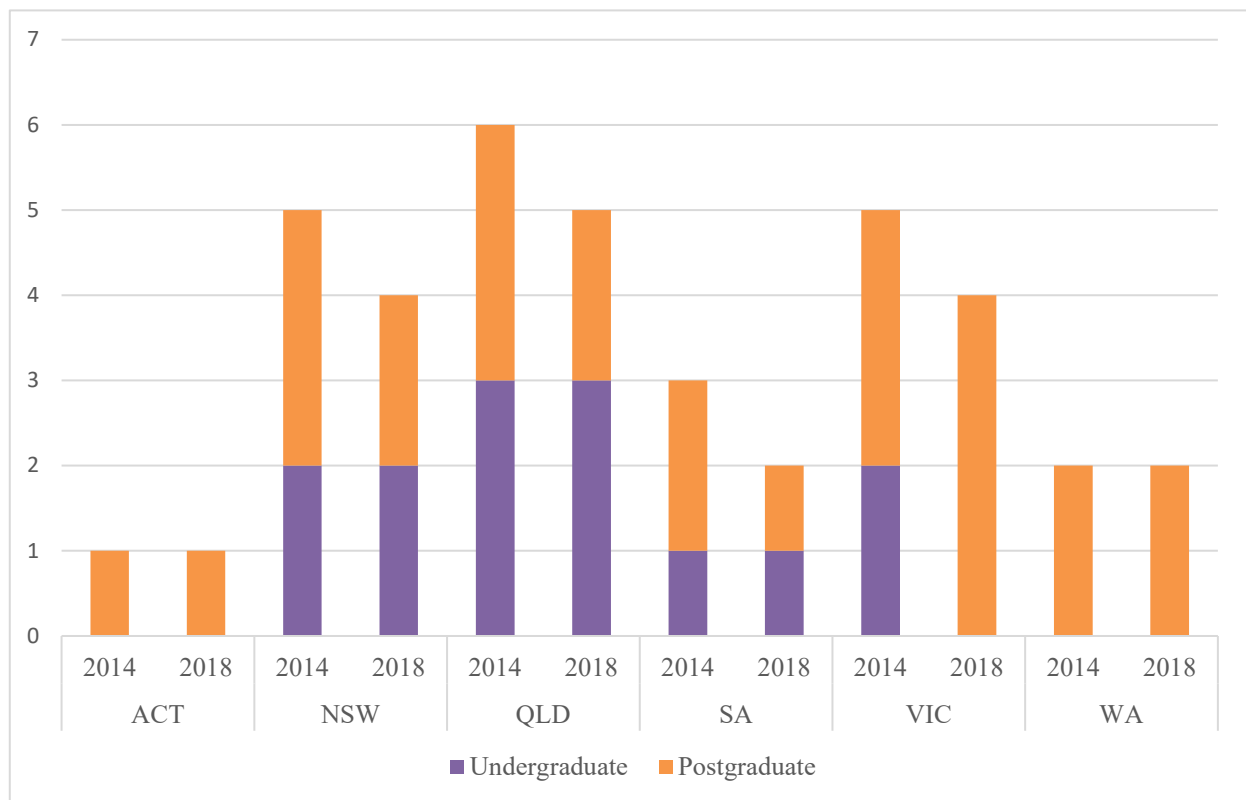
### **1.6.1. The dietetics workforce preparation landscape**

Dietetics workforce preparation is embedded within the health care and the higher education systems. It is widely recognised that both sectors are under increasing pressure to perform and are facing significant challenges, not only in Australia but internationally.<sup>5,9,110</sup> In addition to these factors, dietetics workforce preparation is experiencing its own challenges. Adequate and appropriate placements for students is one issue which has been prominent in dietetics education literature. In particular, placement shortages and funding cuts have presented challenges given the recent growth in dietetics student numbers.<sup>111-113</sup> Moreover, dietetics workforce preparation is affected by the increasingly diverse settings in which dietitians can practice<sup>93</sup> along with an apparent oversupply of dietetics graduates.<sup>69</sup> While there is limited evidence to support these suggestions, it has also been speculated that challenges may include equipping graduates to practice internationally, having valid and consistent assessment tools, and delivering education using relevant technology.<sup>114,115</sup> The above-mentioned factors are likely impacting stakeholders embedded in dietetics workforce preparation including academic dietetics educators, dietetics practice educators, dietetics students and recent dietetics graduates. However, there is a lack of evidence to validate these

postulations. Moreover, it appears that a systematic review to map and summarise the research regarding dietetics workforce preparation and preparedness in Australia has not been conducted.

### **1.6.2. Dietetics education programs**

Hundreds of institutions across the world offer dietetics education programs.<sup>87</sup> The number of programs offered in Australia has increased significantly over the past 3 decades. In 1987 there were reported to be five institutions offering dietetics education programs in Australia.<sup>116</sup> In 2014, eighteen universities offered a total of twenty-two dietetics education programs in Australia (Figure 1-3, Table S1-1) – a figure which was verified by the national authority, Health Workforce Australia.<sup>69</sup> Masters-level programs were the dominant degree (n=14/22; 64%) and Queensland offered the most programs (n=6/22; 27%). In 2018, the numbers of both dietetics education programs and universities offering programs had decreased to eighteen and sixteen, respectively (Figure 1-3, Table S1-1). Masters-level programs (12/18; 67%) and programs offered in the state of Queensland (5/18; 28%) still predominated.<sup>117</sup> Between 2014 and 2018, three universities ceased to offer a dietetics education program (Charles Sturt University, NSW; Victoria University, Vic; and University of South Australia, SA) and one university commenced a program (Swinburne University, Vic) (Table S1-1).



**Figure 1-3** Dietetics education programs in Australia in 2014 and 2018 by state and degree level<sup>69,117</sup>

### 1.6.3. Key stakeholders in dietetics workforce preparation

The phenomena of dietetics workforce preparation and preparedness involve many stakeholders. This thesis will focus on four key stakeholder groups embedded in the phenomena of interest. They are:

1. dietetics students (also referred to as interns or student dietitians in some countries/literature);
2. dietetics graduates (also referred to as entry-level dietitians in some countries/literature);
3. academic dietetics educators (also referred to as academics or professors in some countries/literature); and
4. dietetics practice educators (also referred to as supervisors, clinical educators, preceptors or work-based educators in some countries/literature).

Additional stakeholders who play a part in the phenomena under investigation include employers of recent dietetics graduates and the patients/clients who receive the service of those recent graduates (e.g. the general public). However, including those and other stakeholders was outside the scope of this thesis. Further rationale for selecting the abovementioned key stakeholders to be involved in this research is provided in Section 3.4.1.

#### **1.6.4. Attributes of dietetics educators in practice and academia**

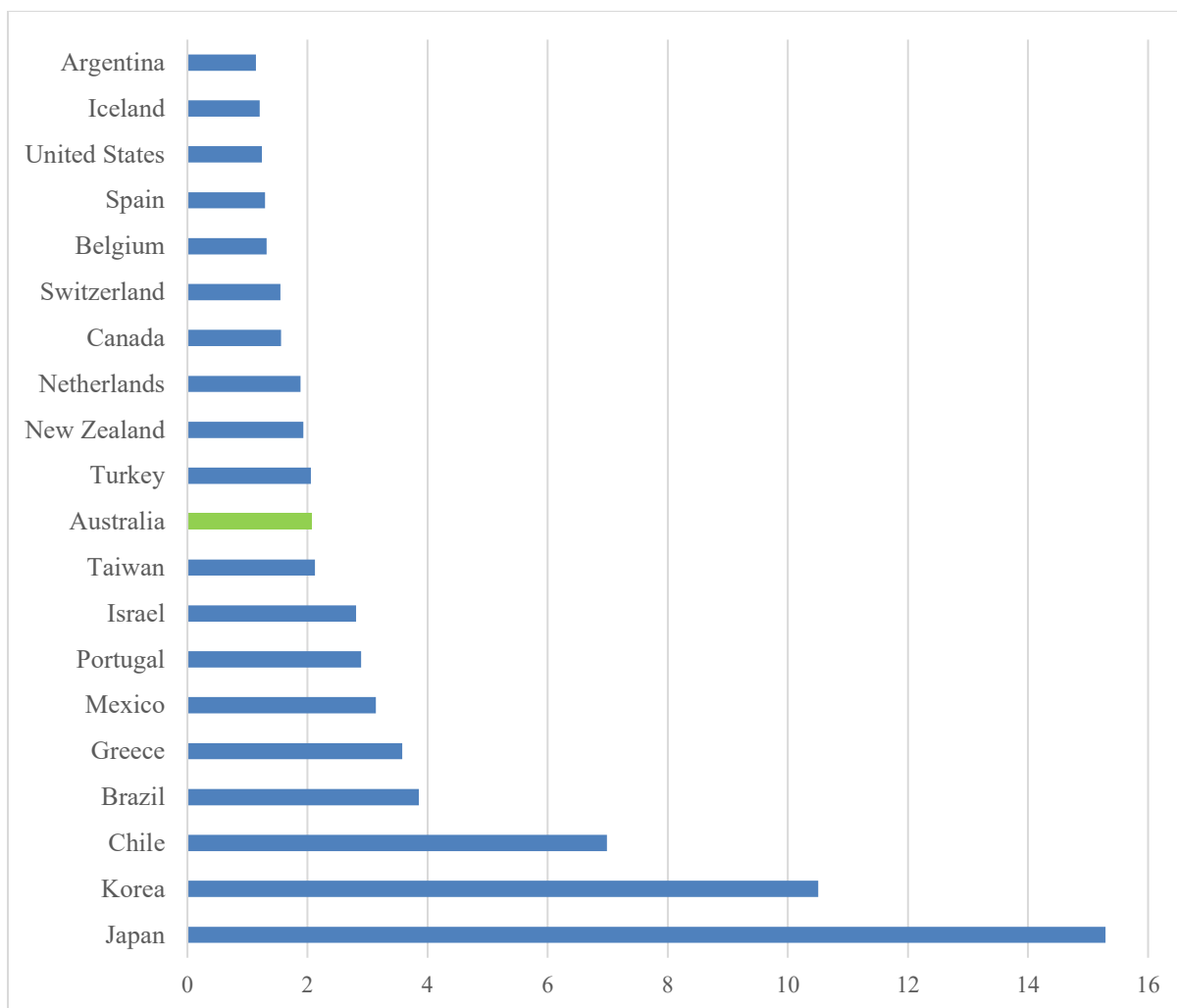
The stakeholders primarily involved in preparing dietitians for the workforce are academic dietetics educators and dietetics practice educators. While there is little available data on these educators, given the apparent rise in dietetics education programs across the world and international data suggesting that ‘academia/research’ is a growth area for dietitians internationally,<sup>59</sup> it is plausible that both these workforce groups are increasing in size. There also appears to be a significant lack of information regarding academic dietetics educators and dietetics practice educators working in Australia. In 2004, 5% of DAA members worked in an ‘educational institution’<sup>73</sup> and by 2011, around 8% of members reported working in ‘research/education’.<sup>100</sup> While these figures provide some indication of the size and expansion of the Australian academic dietetics educator workforce, they should be interpreted with caution (e.g. figures may have included researchers and practice educators/professional placement supervisors). Data regarding the total size, apparent increase in number and professional attributes of both these key stakeholder groups would be valuable to inform dietetics workforce preparation planning.

#### **1.6.5. Attributes of dietetics students and graduates**

As workforce inflows of the workforce preparation system,<sup>1</sup> dietetics graduates and dietetics students are integral stakeholders. Quantifying dietetics students and graduates within and

across countries can indicate workforce growth and assist in analysing trends to inform workforce planning. The total number of dietetics graduates entering the workforce internationally each year is unclear. However, based on estimates from national dietetics associations as collated by the ICDA, this number is likely to be over 50,000.<sup>87</sup> Data regarding the number of students completing dietetics education programs per 100,000 population have been collated from 41 ICDA member countries who provided data in a 2016 survey (Figure 1-4, Table S1-2). These data suggest that on a per capita basis (per 100,000 population) Australia is producing more dietetics graduates than the United States, Canada and the United Kingdom. However, due to data collection issues experienced by the ICDA, this information is likely out of date (C. Middleton, personal communication, 22 September 2018).

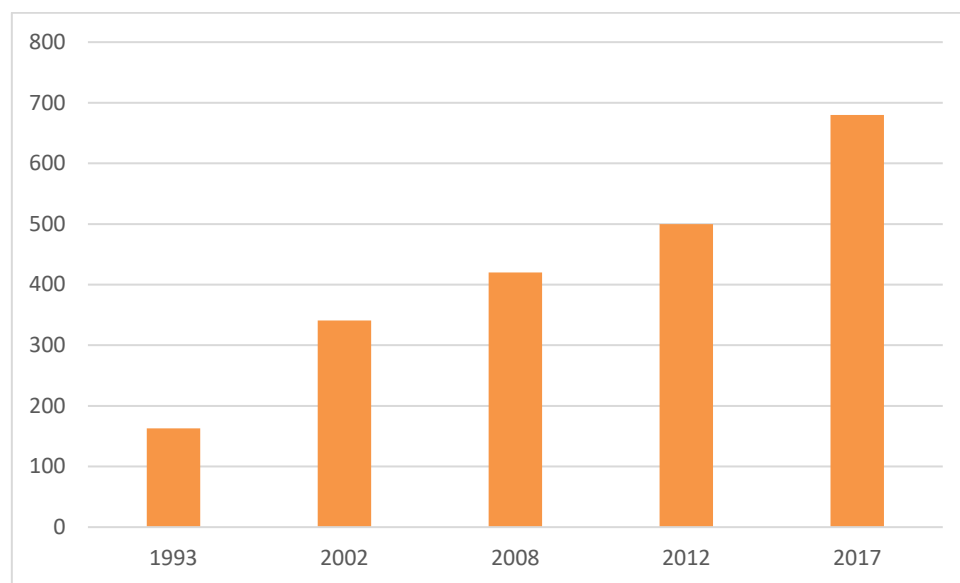




**Figure 1-4** Countries with the highest number of dietetics students graduating each year per 100,000 population based on data collected by the ICDA in 2016 (C. Middleton, personal communication, 22 September 2018)

The number of students commencing and completing dietetics education programs in Australia is increasing (Figure 1-5).<sup>69</sup> However, there is a lack of current and robust data to specify numbers or to confirm the percentage increase. In 2002, it was reported that there were 341 dietetics graduates in Australia<sup>118</sup> which increased to over 500 in 2012.<sup>119</sup> More recently, the DAA estimated that in 2017 there would be around 680 dietetics graduates (K. Bartlett, personal communication, 1 March 2018). This indicates an average year-on-year growth rate of around 5% in dietitians graduating from Australian universities per year. It also suggests that the proportion of qualified dietitians graduating from universities in

Australia is increasing (3.5% year-on-year growth rate from 2002-2008, 5.5% year-on-year growth rate from 2008-2017). While attrition rates are unclear, the workforce could be growing by approximately 10% each year (based on DAA members = 6800, total dietitians = 8500, total graduates = 680). There is no consensus on what constitutes the ‘emerging workforce’ of dietitians. However, examples in practice and in the literature indicate it may be within two years and up to five years post-graduation.<sup>120,121</sup>



**Figure 1-5** Number of dietetics student completions (graduates) in Australia by year<sup>69,118,119</sup>

Student commencements can also provide some indication of how interest in dietetics, and how the emerging profession, is growing. National data showed that dietetics university commencements increased between 1993 and 2003<sup>118</sup> with one Australian university noting a 300% increase in dietetics student enrolments between 1991 to 2001.<sup>122</sup> More recently, national data indicated that in 2012, 694 students commenced dietetics education programs across Australia with enrolments in postgraduate dietetics education programs increasing at a greater rate than those in undergraduate programs.<sup>69</sup>

In regards to gender split, it has been reported that more than 90% of students and graduates (90.5% of student commencements and 91.4% of student completions) are

female.<sup>69</sup> This is slightly lower than the total proportion of females in the existing dietetics workforce (~95%)<sup>69</sup> and may suggest a trend towards more males enrolling in dietetics education programs and subsequently entering the workforce.

#### **1.6.6. Dietetics workforce demand**

In recent years, national authorities in Australia have indicated that demand for the dietetics workforce is low. In 2012, the Australian Workforce Productivity Agency (AWPA) stated that “the domestic supply of new graduates and existing workers is sufficient to meet demand”<sup>123(p2)</sup>, that “the occupation is likely to be in oversupply in the medium term”<sup>123(p2)</sup> and that “there is no shortage of dietitians apparent.”<sup>123(p2)</sup> These statements were based on evidence indicating that there was strong growth in the supply of new graduates and low turnover of labour in the profession, along with employers attracting large numbers of candidates in recruiting for dietetics positions. Despite this, the AWPA also indicated that dietitians are important to meet government policy priorities and that a national shortage of dietetics skills would result in a significant cost to the community and/or economy.<sup>123</sup>

Claim such as these have been contested by the DAA, who have stated that demand for dietitians is strong and will continue to grow.<sup>72,97</sup> The DAA also stated that if growth in dietitians working in private practice were to continue, shortages in the public sector would likely occur.<sup>97</sup> In particular, a shortage of dietitians suitably-qualified to work in academia was noted.<sup>72</sup> Further, DAA challenged that measures used by national authorities to indicate workforce shortages were inaccurate and did not reflect the true health need for dietitians in the community.<sup>97</sup> Specifically, that the filling of advertised positions did not account for the creation of non-advertised positions and new businesses (e.g. private practices), and the inclusion of ‘nutritionists’ in national census data grossly overestimated the supply of dietitians for workforce planning purposes.<sup>72</sup> Additionally, the AWPA data was limited by

the exclusion of dietitians practising outside of government health departments (e.g. in private practice).

More recently, the national statutory authority, Health Workforce Australia (HWA), provided a snapshot of the dietetics workforce in Australia as at 2014.<sup>69</sup> Their assessment concluded that all workforce dynamics indicators showed no real areas of concern for the future of the dietetics profession. The HWA report showing there were high numbers of student commencements, student completions and recently-graduated dietitians along with shortages of more experienced, senior dietitians reflects previous claims regarding supply and demand. This report also featured the DAA's view that the expected increase in the number of dietetics graduates over the next five years would exacerbate the existing oversupply of less experienced, recently graduated dietitians. Given the lack of recent, robust, consistent and nationally-coordinated data on the dietetics workforce, it is difficult to substantiate these claims. The DAA also expressed concerns about the adequacy of workforce data and the ability make future projections to inform workforce planning.<sup>69</sup>

Regardless of these analyses of dietetics workforce demand, it is reasonable to assume that projected increases in population growth and ageing populations along with the growing burden of overnutrition and multimorbidity will likely lead to increased demand for health professionals with skills to address nutrition-related health.

#### **1.6.7. Perspectives of key stakeholders in dietetics workforce preparation**

As stakeholders embedded in the phenomena, academic dietetics educators, dietetics practice educators, dietetics students and recent dietetics graduates are well-placed to provide insights into dietetics workforce preparation and preparedness. Accounts obtained from these informants can be used to understand the challenges that are faced in dietetics education and to inform strategies to enhance the preparation of future dietitians. While a comprehensive

review of the literature is reported in Chapter 2 and was used to inform subsequent studies in this thesis, immersion in the literature provided some preliminary insights into key stakeholders' perspectives which have been previously investigated. This indicated that dietetics workforce preparation and preparedness in Australia has, to some extent, been explored from the perspectives of key stakeholders including dietetics practice educators, students, graduates and employers of graduates. However, this research appears to have focused on specific and/or single aspects of dietitians training and work readiness (e.g. perceptions of a learning activity, preparedness for clinical placement, perspectives on a mentoring initiative) and sampling has often been confined to stakeholders within one state/territory or university. Moreover, immersion in this literature revealed a paucity of evidence regarding key stakeholders' broad experiences of dietetics workforce preparation and preparedness from across the Australia country.

#### **1.6.8. The future of the dietetics workforce**

Preparing dietitians who are responsive to current and future practice landscapes has been a focus of dietetics researchers for more than four decades.<sup>124-126</sup> Given the contemporary challenges facing the dietetics workforce and the apparent failure of health professional education programs to keep pace with current health needs, research envisioning the dietetics workforce of tomorrow is critical to the profession. Countries including the USA, the UK and Canada have been responsive to this task of future-proofing our evolving profession. In the UK, the BDA recently commissioned research to inform the development of a workforce strategy for dietetics for 2020–2030 and made recommendations to prepare the future profession.<sup>127</sup> In the USA, the AND recently established a Council on Future Practice to project future practice needs and ensure the viability and relevance of the dietetics profession.<sup>128</sup> The AND, through its Dietetics Workforce Demand Task Force, has also

commissioned external consultants to help the profession prepare for the future and ensure that dietitians remain at the forefront of nutrition. This research generated multiple reports which developed scenarios and identified change drivers, possible trends and issues shaping the profession that may impact workforce supply and demand.<sup>93,129,130</sup> In Canada, the DC has conducted studies to identify workforce issues affecting the profession, assess projected needs for dietetics graduates and make recommendations for matching supply with demand.<sup>131,132</sup> Strategic efforts to anticipate future challenges and opportunities, and to envision the future directions of the dietetics workforce based on analysis of existing data through a formal, evidence-based and collaborative process has not yet been conducted in Australia.

## **1.7. Problem statement**

The future health workforce is positioned to play a pivotal role in advancing the health of individuals, communities and populations. In particular, the dietetics workforce is ideally-placed to optimise nutrition-related health globally. Given the unequivocal evidence regarding the role of nutrition in health, it is critical to ensure that the future dietetics workforce is equipped to address current and emerging diet-related health needs.

Understanding the attributes of the emerging dietetics workforce and exploring the experiences of key stakeholders involved in dietetics workforce preparation is essential in ensuring the effectiveness of future dietitians and the health of those they will serve.

The WHO recognises the importance of quality data in informing future health workforce planning:

“One of the key health workforce challenges at country level is the availability, completeness and quality of data to support evidence-based policy and planning.

Multiple sources need to be consulted to acquire key information on the size, characteristics and dynamics of the health workforce. However, data quality, comprehensiveness and interoperability are often limited...greater efforts are needed to further realize the benefits of quality workforce data to inform national, evidence-based policy decisions.”<sup>133(p1)</sup>

However, in Australia there appears to be a significant lack of data on both the existing and emerging dietetics workforces. Further, there are clear scholarship deficits regarding the phenomena of dietetics workforce preparation and preparedness in Australia from the perspectives of those key stakeholders embedded in these phenomena. In line with the abovementioned position of the WHO, such evidence inadequacies significantly impede workforce planning and development activities for the dietetics profession. Evidence to inform dietetics workforce planning activities and to enhance future dietetics workforce preparation and preparedness is needed.

Specifically, there is a need for evidence regarding:

1. The existing scholarship on dietetics workforce preparation and preparedness that has been conducted in Australia
2. The size and professional attributes of the academic dietetics educator workforce in Australia
3. The experiences of academic dietetics educators in Australia regarding dietetics workforce preparation and preparedness
4. The experiences of dietetics practice educators in Australia regarding dietetics workforce preparation and preparedness

5. The experiences of recent dietetics graduates in Australia regarding dietetics workforce preparation and preparedness
6. The experiences of dietetics students regarding dietetics workforce preparation and preparedness

## **1.8. Thesis aim**

The overarching aim of this thesis was to explore the phenomena of dietetics workforce preparation and preparedness in Australia. This was predominantly achieved through exploring the experiences of key stakeholders who are involved in these phenomena. The research questions designed to address the aim of this thesis are listed in Table 1-1.



**Table 1-1** Research questions to be addressed by the studies in this thesis

Research question	Study (Thesis Chapter)					
	Systematic mapping review (Chapter 2)	Attributes of dietetics educators (Chapter 4)	Academic educators' experiences (Chapter 5)	Practice educators' experiences (Chapter 6)	Recent graduates' experiences (Chapter 7)	Synthesis of students' experiences (Chapter 8)
1. What scholarship exists regarding dietetics workforce preparation and preparedness in Australia?	X					
2. What is the size and what are the professional attributes of the academic dietetics educator workforce in Australia?		X				
3. How do key stakeholders describe their experiences of preparing dietitians for the workforce in Australia?			X	X		
4. How do key stakeholders describe the experience of being prepared as a dietitian for the workforce in Australia?					X	X
5. What are the challenges faced by key stakeholders in preparing dietitians for the workforce in Australia?			X	X		
6. What are the challenges faced by key stakeholders in being prepared as a dietitian for the workforce?					X	X
7. What are the challenges faced by dietitians entering the workforce in Australia?			X	X	X	

## **1.9. Significance of the research**

Developing a workforce that is effective in advancing the nutrition-related health needs of those it serves is critical to global health. This thesis will explore and describe the preparation and preparedness of the dietetics workforce in Australia – a workforce that has significant potential to make a valuable contribution to advancing the health of the population.

The objective of this thesis is to review, quantify and illustrate evidence that exists around dietetics workforce preparation and preparedness in Australia. It also aims to generate evidence around key stakeholders and their experiences of, and challenges faced, in these phenomena. The scholarship from this thesis will make a valuable contribution to the topic of dietetics workforce preparation and preparedness in Australia. It is expected that findings from this thesis will have implications and application for the dietetics profession – both in Australia and internationally. Such findings can enable strategies to be developed to inform future dietetics workforce planning and development. It is hoped that the implementation of strategies resulting from this thesis will enhance the effectiveness of the future dietitians in Australia and thereby, contribute to optimizing the nutrition-related health of the population.

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## **Chapter 2.        Systematic Mapping Review of Dietetics Workforce Preparation and Preparedness Research**

## **2.1. Preface**

This chapter provides a systematic mapping review of the existing literature regarding dietetics workforce preparation and preparedness that has been conducted in Australia. A narrative review of the literature conducted in the early stage of this thesis informed the direction of subsequent studies. However, this review was later conducted in a systematic manner to formalize the findings and to confirm the rationale for conducting the studies in Chapters 4 to 8.

Immersion in the literature revealed that a systematic review to map and summarise the research regarding dietetics workforce preparation and preparedness in Australia had not previously been conducted. The researchers were based in Australia and immersed in the phenomena under investigation (health workforce preparation and preparedness). Therefore, focusing on the phenomena in Australia was contextually-appropriate.

Systematic reviews typically aim to synthesise findings regarding the effectiveness of interventions. Mapping reviews are used when a body of scholarship exists, yet its scope has not been described, categorised or evaluated. They aim to produce a ‘map’ of the existing evidence and enable gaps in the literature to be identified in order to inform future research. A mapping review to systematically search for, appraise and categorise the evidence regarding dietetics workforce preparation and preparedness in Australia was therefore deemed necessary.

This chapter contains the accepted version of an original manuscript published in a peer-reviewed journal. The formatting of this manuscript is consistent with the thesis style. References for this manuscript appear at the end of the chapter and supplementary tables and figures appear as appendices at the end of the thesis.

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## **2.2. Abstract**

### **2.2.1. Aim**

The present study aimed to systematically map and summarise existing research regarding dietetics workforce preparation and preparedness that has been conducted in Australia. The secondary aim was to then identify gaps in the literature to inform future priority areas in Australian dietetics education research.

### **2.2.2. Methods**

The databases MEDLINE, CINAHL, Embase, ERIC, Informit and PsycINFO were systematically searched from inception until July 2017 using key search terms to identify eligible studies. Extracted data were independently reviewed, and study quality was appraised by multiple researchers. Results were categorised by setting and primary focus/foci and then narratively summarised.

### **2.2.3. Results**

Sixty-eight studies were included from 3779 records identified. Dietetics education research in Australia has spanned almost 30 years with more than half of studies (51%; 35/68) published in the last five years. The greatest proportion of research was conducted in the university setting (43%; 29/68), with students as participants (48%; 43/90) and was focused on the medical nutrition therapy area of dietetics practice (43%; 29/68). Published studies involving graduates (14%; 13/90); conducted in the workplace (12%; 8/68); and regarding emerging areas of dietetics practice (0%; 0/90) are lacking. Employment outcomes of dietetics graduates across Australia were last published over 25 years ago.

### **2.2.4. Conclusions**

This review provides a map for dietetics educators and researchers in Australia to guide future research regarding the preparation and preparedness of dietitians. Advancing the

Australian dietetics workforce of the future will require a strategic, coordinated and collaborative approach to address the research gaps identified in this review.

#### **2.2.5. Keywords**

Dietetics education, graduates, review, students, university, workforce

## 2.3. Introduction

An effective dietetics workforce has the potential to greatly impact and optimise the nutritional health of individuals, groups and populations. The Australian dietetics profession has been responsive to evolving workforce needs with periodic reviews of national competency standards.<sup>1</sup> However, strategic and ongoing research is essential to ensure that dietitians have been optimally prepared to practise in the contemporary healthcare environment. With calls to change the way in which dietitians are prepared for practice in Australia,<sup>2,3</sup> an examination of the Australian scholarship regarding dietetics workforce preparation and preparedness is warranted.

Dietetics workforce preparation (also referred to as dietetics education) has been described as the formal process of equipping students with the requisite attributes to independently practise as a dietitian.<sup>4</sup> In Australia, accredited dietetics education programs are required by national accreditation standards to develop student competence through a range of activities which typically take place in universities and professional placement sites.<sup>5,6</sup> The 2015 revision of the National Competency Standards for Dietitians moved away from preparing graduates for certain settings and areas of practice (e.g. food service management) with a greater emphasis on the development of professional attributes that can be applied in any setting.<sup>1,5</sup> Preparedness, a phenomenon that follows workforce preparation, may be referred to as that state of readiness of a dietetics student or graduate for practice and subsequent entry into the workforce. While this phenomenon has been investigated in other health professions such as medicine, pharmacy and nursing,<sup>7-9</sup> the preparedness of students/graduates for dietetics practice has not been systematically evaluated.

Enhancing the preparation and preparedness of future dietitians requires an analysis of robust data regarding the past, current and projected future state of the workforce. However, in Australia there is a lack of such information.<sup>10,11</sup> Despite this, the Dietitians Association of

Australia (DAA) has suggested that both the dietetics workforce<sup>12</sup> and the dietetics education sector<sup>13</sup> have experienced significant growth and change in recent years. It has also been proposed that private practice and food industry are new and emerging areas of dietetics practice.<sup>1</sup> Further, in 2015 it was estimated that with approximately 600 dietetics graduates entering the workforce each year, the profession in Australia was growing at around 10% annually.<sup>11</sup> Given this apparent expansion and evolution, a parallel increase in dietetics research would be expected but is yet to be investigated.

Mapping reviews are designed to produce a ‘map’ of existing research by identifying and categorising literature from an established body of scholarship. While mapping reviews are not always systematic in their approach and do not aim to answer questions regarding the effectiveness of interventions, they typically characterise the volume and quality of literature on a topic. Their results can highlight gaps in the literature, inform future research priority areas and provide health professional educators with direction on their research and education activities.<sup>14,15</sup> Such reviews have been beneficial in providing guidance for academic and educational activities in other health professions including occupational therapy and medicine.<sup>16-19</sup> Despite the existence of an increasingly vast body of health professions’ education literature,<sup>20</sup> profession-specific education research can be used to better prepare students to address future challenges.<sup>21</sup>

Optimising dietetics education and the future dietitians involved in this phenomenon requires a coordinated, strategic approach to research regarding dietetics workforce preparation and preparedness. Results of such an approach have the potential to identify gaps and guide future dietetics education research, and to enhance effective dietetics workforce development. This review aims to systematically map and summarise existing research regarding dietetics workforce preparation and preparedness that has been conducted in Australia. The secondary aim of this review is to then identify gaps in the literature to inform

future priority areas in Australian dietetics education research. This review will help to progress dietetics workforce development and enhance the effectiveness of future dietetics education and practice in Australia.

## **2.4. Methods**

This review follows the format recommended in the Preferred Reporting Items for Systematic Reviews and Meta-Analysis: the PRISMA Statement,<sup>22</sup> and was guided by an *a priori* protocol developed to ensure methodological transparency. As mapping reviews are outside the scope of the International Prospective Register of Systematic Reviews (PROSPERO) (PROSPERO) requirements<sup>23,24</sup> this review was not registered. Ethical approval was not required.

The search strategy was developed based on the review's aim, the PICO tool (Population, Intervention/exposure, Comparison, and Outcome)<sup>25</sup> and author consensus, and was refined with the assistance of a health sciences librarian to optimise retrieval of relevant studies. A comprehensive and systematic search of the electronic databases MEDLINE (Ovid), CINAHL, Embase, ERIC, Informit and PsycINFO (Ovid) was conducted from inception to July 2017. No date or language limits were set. Reference lists of eligible studies were hand searched including issues of key journals published since July 2017 until December 2017 to identify any other eligible studies. The basic search strategy was adapted for use across the different electronic databases listed (Table S2-1).

Studies were eligible for inclusion if they: 1. investigated or described an aspect of dietetics workforce preparation and/or dietetics workforce preparedness; 2. involved participants who were key stakeholders in dietetics workforce preparation (i.e. dietetics students, graduates, educators, practice educators/supervisors/clinical educators/preceptors, and patients/clients involved in dietetics workforce preparation/preparedness); and 3. were



conducted in Australia or in relation to an aspect of dietetics workforce preparation and/or preparedness in Australia. Parameters for the phenomena of dietetics workforce preparation and preparedness were conceptualised within the curve of improving performance in healthcare as described by Khan,<sup>26</sup> whereby students generally enter university as ‘incompetent’ and they progress through a series of stages to emerge as ‘competent’ graduates who proceed towards becoming ‘proficient’ in the workplace. Studies reporting on the preparation and/or preparedness of dietitians together with other health professionals (e.g. dietetics and physiotherapy students) were excluded, as were studies that investigated or described the development of competency standards for dietitians in Australia. Only original research studies were included. Editorials, review articles, commentaries/opinion articles, letters and conference abstracts were not eligible for inclusion.

All records identified by the search were exported into EndNote (Version 8) and duplicates were removed. Articles were reviewed for relevance against the pre-determined inclusion/exclusion criteria via the title, abstract and author address (KM), and independently cross-checked by a second (RH) and third researcher (JK). Full-text records that appeared to be eligible for inclusion were retrieved and reviewed (KM), and independently cross-checked by a second researcher (JK). Researchers then compared results to ensure consistency and identify the level of agreement. Another researcher (DR) resolved disagreements by independently examining disputed studies and discussing with other researchers until consensus was reached. One researcher (KM) reviewed the reference lists of eligible articles and recently published key journals to identify additional relevant studies.

A data extraction tool was developed with fields designed to capture key characteristics of included studies. Data which were relevant to the study’s citation, design, participants, intervention (aspects of dietetics workforce preparation/preparedness investigated), context (setting and state), and practice area (area of dietetics practice) were

systematically extracted into evidence tables. Categorisation of dietetics practice areas was guided by terms and descriptors used in national accreditation and competency standards.<sup>6,27</sup> Despite the removal of practice areas from the most recent competency standards, current accreditation standards for dietetics education programs in Australia state that in the professional placement program, students should be able to demonstrate competence in medical nutrition therapy, food service and public health nutrition.<sup>6</sup> In regard to the intervention or aspects being investigated, the primary focus/foci of each study were deemed by researchers as being in either one or more of the following six categories – activity (curriculum / placement / workplace), assessment, competency development, stakeholder attributes, stakeholder views and other. Extracting data into evidence tables was conducted by one researcher (KM), reviewed by a second researcher (JK) and disputes were resolved via a third researcher (DR).

The quality assessment tool developed by Hawker<sup>28</sup> designed for systematically appraising disparate studies, was used to assess the quality of included studies. Each study was assessed by two independent reviewers (KM & JK). Any disagreements were resolved through discussion with a third researcher (DR). The quality of each study was critically appraised using a pre-determined set of questions in which nine aspects of each study was assessed as either good, fair, poor or very poor.<sup>28</sup> Quality appraisal results were combined and presented in graphical form to summarise the quality of the cumulative evidence.

Due to the heterogeneous nature and variation of included studies' designs, a meta-analysis and/or a thematic synthesis was not appropriate nor was it in line with the review's aim. In accordance with Grant and Booth's description of a systematic mapping review,<sup>14</sup> the content from included studies was collated to enable a descriptive analysis and summary of the existing literature. Where studies included multiple aspects (e.g. assessment and competency development) or multiple populations (e.g. students and graduates), the total

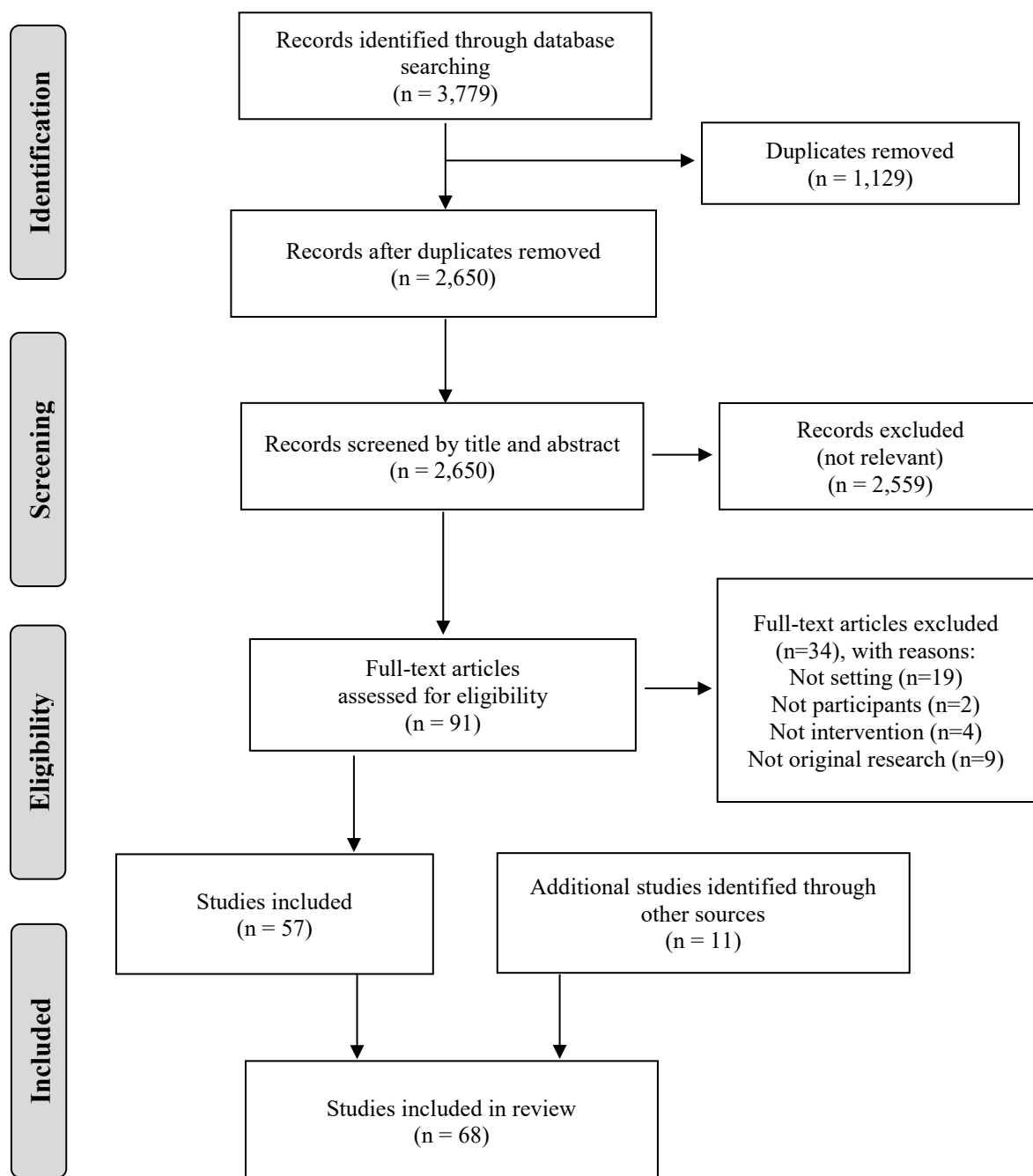
number of characteristics were tallied which meant there could be more characteristics than there were included studies. Pooled study characteristics were represented in both graphical and tabular form, and frequencies were narratively described. Studies were categorised into one of three settings of interest (i.e. university, placement, workplace). The different aspects being investigated (primary focus/foci) in each study were then plotted against a grid to enable comparison across the three settings and relative proportions narratively summarised.

## **2.5. Results**

A total of sixty-eight studies met the inclusion criteria and were included in this review.<sup>3,11,29-</sup>

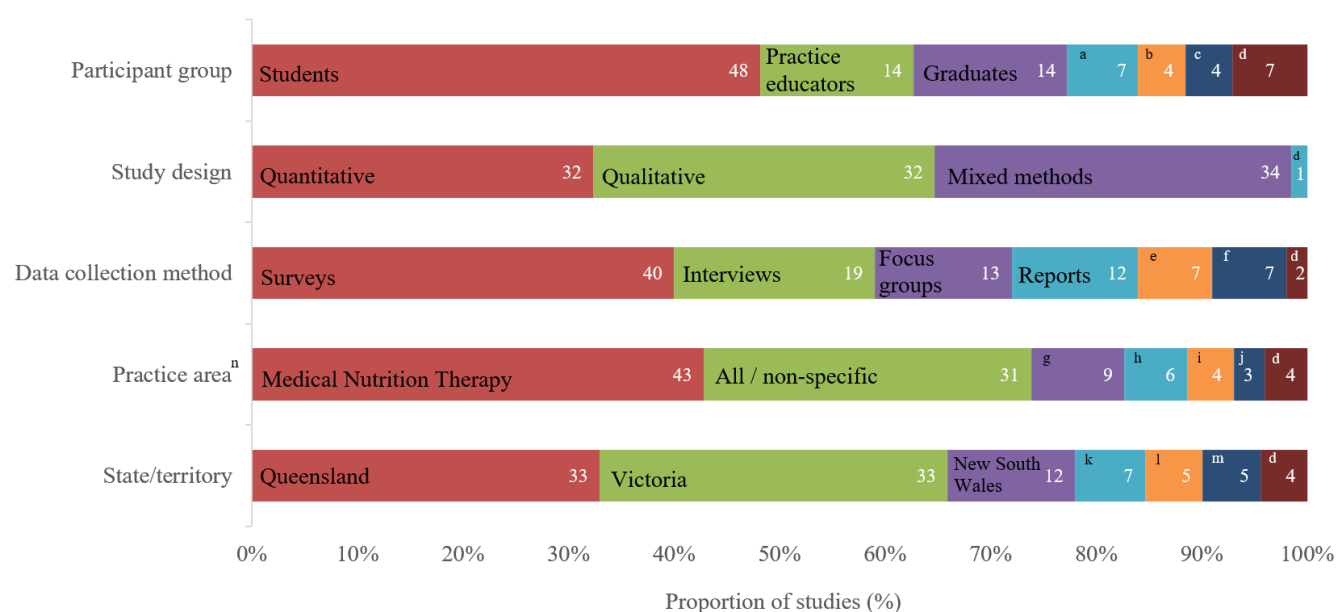
<sup>94</sup> Fifty-seven studies were identified from the search of 3,779 records (Figure 2-1) with an additional 11 studies identified through hand searching.

Published dietetics education research in Australia has spanned almost 30 years with the earliest study published in 1990. More than half (51%; 35/68) of the studies were published in the last five years (2013 – 2017 inclusive) and more than three-quarters (77%; 52/68) were published since 2009 (Figure S2-1).



**Figure 2-1** PRISMA flow chart outlining the process of study selection for systematic mapping review of dietetics education research in Australia

The pooled characteristics of all studies included in this review are shown in Figure 2-2 and full characteristics for each study are shown in Table S2-2. The use of multiple different participant groups was employed by 26% of studies (18/68) resulting in a total of 90 participant groups across all studies. Students were the most frequently studied participants (48%; 43/90) while only one study (1%;1/90) sampled employers of recent graduates and only 14% (13/90) involved graduates themselves. A total of 95 instances of data collection from seven different data collection methods were used across the 68 studies. Nearly one third of studies (28%; 19/68) employed a combination of these data collection methods with surveys (40%; 38/95) being the predominant method of collecting data.



**Figure 2-2** Pooled characteristics of studies regarding dietetics workforce preparation and preparedness in Australia

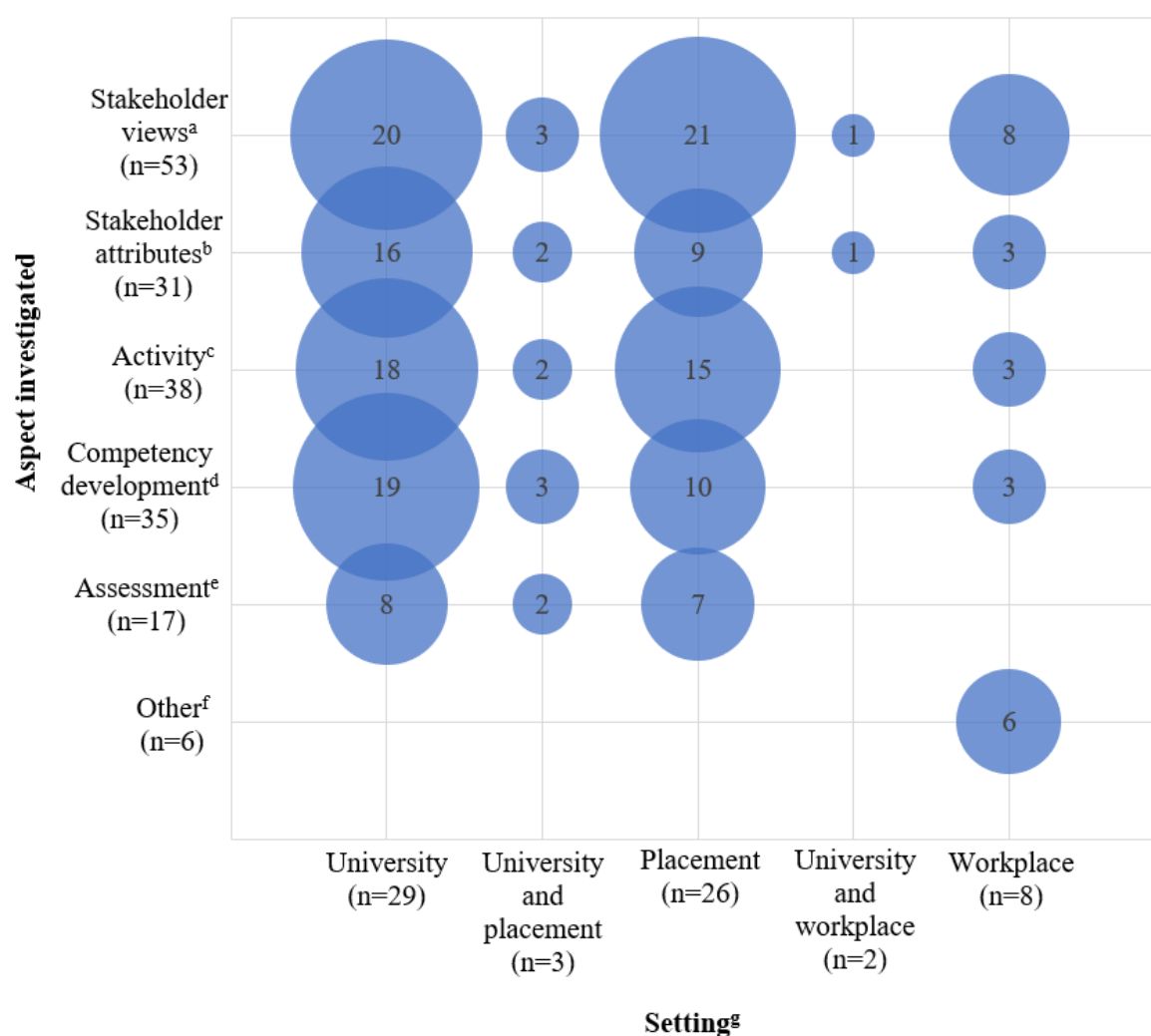
<sup>a</sup> Academic educators; <sup>b</sup> practitioners; <sup>c</sup> clients; <sup>d</sup> other; <sup>e</sup> document analysis; <sup>f</sup> discussion; <sup>g</sup> community and/or public health nutrition; <sup>h</sup> medical nutrition therapy, community and/or public health nutrition and food service management; <sup>i</sup> medical nutrition therapy and community and/or public health nutrition; <sup>j</sup> food service management; <sup>k</sup> South Australia; <sup>l</sup> Western Australia; <sup>m</sup> Australian Capital Territory; <sup>n</sup> medical nutrition therapy: includes activities related to the management of nutrition care for individuals, clients and/or patients; community and/or public health nutrition: includes activities related to the planning, implementation and evaluation of nutrition programs with groups, communities or populations; food service management: includes activities related to managing components of a food service system to nutritionally dependent and/or vulnerable populations; all: no single area of dietetics practice specified; includes activities that could be related to all areas of dietetics practice.

In regard to the area of dietetics practice that studies focused on, the largest proportion of studies were solely focused on medical nutrition therapy (MNT) (43%; 29/68) while only one study focused on the area of research (1%; 1/68). Almost two-thirds (65%; 44/68) of studies focused on either one or more of the practice areas of MNT, community and/or public health nutrition (CPHN) and food service management (FSM). No studies were specifically focused on the emerging areas of private practice or the food industry.

Six studies (6/68; 9%) were conducted across multiple states/territories of Australia, with research being conducted in the six different states/territories a total of 91 times across the 68 studies. Queensland and Victoria were the states in which the most research was conducted (both 33%; 30/91) followed by New South Wales (12%; 11/91).

Figure 2-3 shows the aspect of dietetics workforce preparation and/or preparedness (primary focus/foci) being investigated by all studies across each of the three settings (i.e. university, placement, workplace) and across multiple settings (e.g. university and placement). A total of 180 aspects were investigated across the 68 studies, as shown in Table S2-2. Compared to the university (43%; 29/68) and placement (38%; 26/68) settings, a relatively small proportion of research has been conducted in the workplace setting (12%; 8/68) (Figure 2-3). The number of studies that investigated attributes of stakeholders in the workplace (e.g. graduates and their employers) are also limited (2%; 3/180). The ‘Other’ aspects investigated in the workplace setting included mentoring (2%; 3/180) and graduate employment outcomes (2%; 3/180). Research reporting on the employment outcomes from a national sample of dietetics graduates in Australia was last published in 1991. In regard to research reporting on the views of stakeholders, these were frequently investigated in the university and placement settings (e.g. students, practice educators) compared to the views of

stakeholders in the workplace setting (e.g. graduates and employers of graduates) which were less commonly reported.



**Figure 2-3** Aspects of dietetics workforce preparation and/or preparedness investigated within different settings

<sup>a</sup> Views, opinions or insights expressed by any stakeholder/s in dietetics education regarding their experiences or observations (subjective)

<sup>b</sup> An attribute, trait or characteristic of a stakeholder/s in dietetics workforce preparation that can be measured (objective)

<sup>c</sup> An activity conducted in the university/placement/workplace setting regarding the preparation, preparedness and/or professional development of students and/or recent graduate dietitians for the workforce

<sup>d</sup> An activity that is aimed at measuring, investigating or developing the competence of dietetics students/graduates

<sup>e</sup> An activity that involves students being assessed on an aspect of professional competence as a part of a dietetics education program

<sup>f</sup> Any other aspect of dietetics workforce preparation / preparedness that is investigated in the study but does not fall into one of the previous categories of aspects investigated

<sup>g</sup> Results tallied along the X axis relate to single studies conducted in those settings. However, as most studies investigated multiple aspects some studies may be represented in the Y axis more than once.

Quality appraisal of the research (Figure S2-2) indicated that the Introduction and Aims were well articulated across studies and therefore commonly rated as ‘good’ using the chosen tool. However, many papers (25%; 17/68) showed ‘poor’ or ‘very poor’ ratings when ethics and bias were considered. While these elements may have been present but not reported in the studies, it could also mean that collectively, the research lacked ethical rigour and may have been influenced by researcher bias.

## **2.6. Discussion**

This systematic mapping review provides the first broad examination of the scholarship conducted in Australia regarding the preparation and preparedness of the dietetics workforce. It demonstrates that research on this topic has been increasing in line with the reported expansion of the dietetics workforce and the dietetics education sector across the country.<sup>12,13</sup> With a total of 68 studies included in this review, a country-specific body of evidence for dietetics education in Australia exists. However, there appears to be a relative overrepresentation of research from some settings (i.e. universities), participants (i.e. students) and areas of practice (i.e. MNT). Research in certain settings (e.g. workplaces), on certain participants (e.g. graduates) and in regard to emerging areas of dietetics practice (e.g. private practice and food industry) is lacking.

The findings that a relatively small proportion of research has been conducted in the workplace and has involved graduates and employers are noteworthy. Further analysis regarding the aspects of dietetics workforce preparation/preparedness investigated in the workplace setting reveal that there is a gap in published research on: the attributes of graduates (e.g. age, gender, state of graduation); graduate professional development activities (e.g. mentoring); and graduate employment outcomes (e.g. status of employment, time taken to secure work, area of practice). The finding that employment outcomes of dietetics



graduates across Australia were last reported over 25 years ago is concerning. This indicates a gap in our ability to discern the effectiveness of dietetics education in meeting the needs of our dynamic and evolving workforce. This evidence gap may reflect methodological challenges associated with contacting recent graduates once they have completed their university qualification, and their employers.<sup>95</sup> Further, given the apparent oversupply of dietetics graduates in Australia,<sup>10</sup> it may be of lower priority for academic educators to conduct research on students who have graduated from their programs, and/or graduates may be less willing to participate in research. In the United States, university programs are required by accreditation standards to set goals on graduate employment rates and employer satisfaction.<sup>96</sup> However, this is not a requirement for universities in Australia. In addition, universities may be collecting this data but not making it publicly available. As a self-regulated profession, dietetics is unable to benefit from the comprehensive collection and dissemination of national health practitioner data conducted by the Australian Health Practitioner Regulation Agency which is afforded to other health professions including physiotherapy, occupational therapy and pharmacy.<sup>97</sup> These gaps demonstrate a critical need for research and dissemination activities that provide data and evidence regarding recent dietetics graduates, their views, their attributes and their entry, or attempts to enter, into the workforce.

Pooled study characteristics indicate that there is a relatively large number of studies that involve students as the participants and which pertain to the MNT area of dietetics practice. As most dietetics educators in Australia are required to attribute some proportion of their work activities to research, and that most dietetics educators report having a practice/research specialisation in clinical dietetics,<sup>11</sup> these findings are not surprising. The accessibility of students while enrolled at university, and the incentive for educators to evaluate newly-developed educational activities may also help to explain these results. There

appear to be few published studies which have focused on academic dietetics educators in Australia, who have been recognised as pivotal influencers in dietetics workforce preparation in other countries.<sup>98,99</sup> A plausible reason for this is that academics are actively conducting research rather than being involved as participants. There is also a demonstrated need for research that involves those stakeholders who are receiving, or are impacted by, the service being provided by graduates (e.g. employers, clients). With the Australian Government's desire to ensure that universities continue to improve on outcomes for graduates and employers,<sup>95,100</sup> exploring these gaps will be increasingly important.

More than three quarters of dietetics education research has been conducted in the three states which offer the greatest number of dietetics education programs.<sup>101</sup> This is a likely reflection of the higher proportion of dietetics educators in those states conducting related research or due to those researchers having expertise in education research. The small proportion of dietetics education research which has been conducted across multiple states may indicate a lack of collaboration between dietetics education programs. Initiatives such as a recently-established Community of Practice for Dietetics Educators in Australia<sup>102</sup> may be an effective mechanism for collaborative dietetics education research that capitalises on shared resources and addresses shared issues. This echoes previous calls for strong leadership and academic collaboration within the dietetics education sector for the benefit of both the existing and emerging dietetics profession.<sup>4</sup>

The finding that MNT, FSM and CPHN are the areas of dietetics practice where most studies have been focused, warrants further examination. This finding is logical given that the studies in this review have been pooled over a 27-year period and that these settings have historically been a focus in previous competency and accreditation standards for dietetics education programs in Australia.<sup>27,103</sup> While knowledge and skills developed in established practice areas (e.g. MNT) may be transferable to other practice areas (e.g. private practice),

this is yet to be demonstrated. Also, given that today's dietetics graduates may be working in a range of contexts outside these established areas (e.g. food industry), further data and research is urgently needed to ensure that graduates are well prepared for a range of practice areas.

The demonstrated increase in published studies in recent years confirms the assumption that the volume of dietetics education research is growing along with the apparent expansion of both the dietetics education sector<sup>13</sup> and the dietetics workforce in Australia.<sup>12</sup> The 2009/2010 and 2014/2015 spikes in publications may be reflective of increased dietetics education scholarship associated with the most recent revisions of the national competency standards in Australia, which took place in 2009 and 2014/15.<sup>1,104</sup> The peak of publications seen in 2014 may also have coincided with the surge in dietetics education programs in Australia.<sup>1</sup> In 2014, it was reported that 23 dietetics education programs (either accredited by or seeking accreditation from the DAA) were being offered by 18 Australian universities.<sup>11</sup> Along with a small reduction in accredited dietetics education programs since 2014 (in December 2017, 18 programs were being offered from 16 universities<sup>101</sup>) the volume of dietetics education research published each year appears to have decreased from 2014 to 2017. As the dietetics educator workforce continues to develop and evolve, it is reasonable to assume that research regarding dietetics workforce preparation and preparedness will stabilise, if not increase, in future years.

It is recognised that a significant amount of research conducted outside of Australia and regarding health professions other than dietetics can be used to inform the preparation and preparedness of dietitians in Australia. To address the review's aims, only research regarding workforce preparation and preparedness in Australia was considered. Due to the heterogeneous nature of the research methodologies of included studies (qualitative, quantitative and mixed methods) in this review, a quality appraisal tool was chosen to

standardise the assessment. However, this may have unfairly biased the assessment of some studies which were not well-matched to the tool. For example, short reports and case studies were appraised in the same way as full, original research articles. Further, the ethical rigour aspects of the quality assessment tool required multiple criteria to be met for studies to be classified as ‘good’. Also, studies published almost 30 years ago were appraised in the same way as studies published in 2017, despite significant advancements in the protocols, practices and guidelines which exist to guide research today. The categorisation of studies into areas of practice may not reflect the main areas of practice where dietitians in Australia currently work. Due to a lack of published data on current dietetics practice areas, efforts were made to align categories with areas described in Australian dietetics competency and accreditation standards. Also, researcher discretion was sometimes needed to interpret the related area of practice and aspect of dietetics workforce preparation being investigated in each study.

While the development of national competency standards is relevant to dietetics workforce preparation, studies focusing on this topic were excluded. This was in recognition of competency standards being applicable to the entire dietetics workforce (not just those being prepared for the workforce), the broader body of evidence used to inform competency standard development and that a review and description of competency standard development in Australia has previously been described.<sup>1,5,105</sup>

A synthesis of results which is characteristic of most systematic reviews (e.g. a meta-analysis of quantitative studies or a thematic synthesis of qualitative studies) was not possible nor appropriate in this review. However, this review was methodologically enhanced by a systematic approach being taken to the search, appraisal and analysis of included studies. This is not typical of mapping reviews<sup>14</sup> but was carried out in order to enhance rigour. Multiple researchers were involved in all stages of the review, which was also strengthened through the development of an *a priori* protocol, pre-determined data extraction tools and the

development of consensus on any disputed results through iteration and researcher discussion.

This review has demonstrated that there are gaps in the research that currently exists regarding dietetics workforce preparation and preparedness in Australia. While ongoing research regarding these important phenomena and in this evolving workforce sector is required, the following categories and specific areas highlight existing gaps in scholarship, including:

- Participants: graduates, employers, academic educators
- Settings: workplaces
- Areas of practice: emerging areas such as private practice and food industry
- States/territories: multiple/combined states/territories

In addition, significant gaps exist regarding aspects of dietetics workforce preparation and preparedness that have been investigated in the workplace setting (i.e. attributes, views and activities of recent graduates in Australia). The development of a national database to profile dietetics graduate attributes in Australia may be a useful tool to enable: the dietetics profession to analyse trends in the emerging workforce; dietetics educators to plan and execute relevant curricula and activities; and dietetics students and graduates to manage their expectations regarding career choices and to make informed decisions on future career paths.

This systematic mapping review provides evidence of existing research regarding the preparation and preparedness of the dietetics workforce in Australia and can be used to guide dietetics educators and researchers in future research. Whilst it is encouraging that a body of dietetics education research exists and has been increasing, if the Australian dietetics workforce of the future is to further advance the nutrition-related health of the population, a strategic, coordinated and collaborative approach is recommended to address the research gaps identified in this review.

## **2.7. Disclosures**

There are no conflicts of interest to declare.

## **2.8. Acknowledgements**

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## **Chapter 3.      Methodology**

### **3.1. Preface**

This chapter will cover methods that are shared across multiple chapters employing a qualitative design. These chapters include:

- Chapter 5. Qualitative Exploration of Academic Dietetics Educators' Experiences
- Chapter 6. Qualitative Exploration of Dietetics Practice Educators' Experiences
- Chapter 7. Qualitative Exploration of Recent Dietetics Graduates' Experiences

For remaining chapters which did not take a qualitative approach, the methods are reported in manuscript form for each study. These include:

- Chapter 2. Systematic Mapping Review of Dietetics Workforce Preparation and Preparedness Research
- Chapter 4. Professional Attributes of the Academic Dietetics Educator Workforce
- Chapter 8. Qualitative Synthesis of Dietetics Students' Experiences

### **3.2. Disclosure of researcher position**

When researchers closely engage with the research and participants (e.g. they are an instrument in data collection, analysis and synthesis) their perspectives can influence the outcome in qualitative studies.<sup>1,2</sup> Therefore, it is important for researchers who will be exploring, describing and interpreting participant's perspectives to demonstrate reflexivity. That is, they should be explicit about relevant characteristics, their position as well as their professional and personal experiences that may impact the research and its findings<sup>3-5</sup> (reflexivity is described further in Section 3.4). Providing such information enhances credibility and enables readers to determine if and how these attributes may have influenced the research findings.<sup>2</sup>

The primary researcher's\* professional background and experiences that are relevant to the thesis topic and approach taken include that she:

- has experienced the phenomena of dietetics workforce preparation and workforce preparedness, graduating as a dietitian from a dietetics education program in Australia in 2008 and gaining employment as a dietitian in corporate nutrition thereafter;
- has been practising as a dietitian in Australia while being a member of the Dietitians Association of Australia (DAA) since 2008;
- has been involved in the preparation (e.g. teaching, assessment, convening) of students in undergraduate health education programs at Bond University since March 2012;
- is currently employed as an academic dietetics educator and has been involved in the development and implementation of a postgraduate dietetics education program at Bond University since March 2013;
- has reviewed literature which has provided some insights into dietetics workforce preparation and workforce preparedness since commencing this thesis in March 2013; and
- has an interest in understanding how dietetics workforce preparation and preparedness can be enhanced in the future.

The primary researcher's\* professional background, experiences and preliminary investigations influenced her personal thoughts and perspectives on the topic being investigated, and therefore may have impacted the research undertaken in this thesis. In her experiences as a dietetics student, graduate and educator, the primary researcher was motivated to conduct the research due to frustrations generated from:

\*While first person can be used to enhance positionality in qualitative research, there is no mandated rule on the use of first person in contemporary academic writing.<sup>6</sup>This thesis is written in third person for consistency and to align with terminology used in the manuscripts published and under peer-review (Chapters 2, 4, 5, 6, 7 & 8).

- her experience as a dietetics student – observing a lack of collegiality between stakeholders in dietetics workforce preparation, especially between dietetics students and dietetics educators and supervisors
- her experience as a dietetics graduate – being primarily prepared for three areas of dietetics practice (i.e. clinical dietetics, food service management and community and public health nutrition) while gaining employment and commencing a career in an area of dietetics practice for which she was not well-prepared (i.e. food industry/corporate nutrition)
- her experience as a dietetics educator – recognizing how the lack of available data on the emerging and established dietetics workforce in Australia, impedes stakeholders’ efforts to prepare dietitians for the workforce
- her experience as a dietetics educator – having an awareness (from self and fellow educators) that there were many challenges faced in attempting to prepare dietitians for the workforce, yet little evidence to validate this and advocate for change
- her experience as a dietetics educator – perceiving a lack of collaboration between stakeholders in dietetics workforce preparation (e.g. between academic dietetics educators) which could be enhanced for the benefit of the profession

The qualitative research conducted in this thesis involved the primary researcher\* (KM) and four additional researchers (DR, KC, SS, LC). The characteristics, credentials, positions and experiences of all researchers involved in the qualitative research in this thesis are outlined in Table 3-1.

\*While first person can be used to enhance positionality in qualitative research, there is no mandated rule on the use of first person in contemporary academic writing.<sup>6</sup> This thesis is written in third person for consistency and to align with terminology used in the manuscripts published and under peer-review (Chapters 2, 4, 5, 6, 7 & 8).

**Table 3-1** Researcher attributes relevant to demonstrating reflexivity and enhancing credibility of qualitative research conducted in this thesis

Researcher	Gender	Qualifications	Credentials	Current role	Professional experience	Research experience
Ms Kate Morgan	Female	BNutrDiet	Accredited Practising Dietitian (APD)	Senior Teaching Fellow, Master of Nutrition and Dietetic Practice program, Bond University PhD Candidate, Bond University	Dietetics educator Corporate nutrition	Dietetics education Qualitative research Systematic reviews
Assoc Prof Dianne Reidlinger	Female	PhD, Postgrad Cert Academic Practice	Accredited Practising Dietitian (APD), Registered Dietitian (RD)	Associate Professor, Master of Nutrition and Dietetic Practice program, Bond University Associate Dean Learning and Teaching, Bond University	Dietetics educator Community and public health nutrition	Dietetics education Qualitative research Systematic reviews
Assoc Prof Katrina Campbell	Female	PhD, BHSc(NutrDiet), HonsI	Advanced Accredited Practising Dietitian (AdvAPD)	Associate Professor, Master of Nutrition and Dietetic Practice program, Bond University Head of Department (Acting), Master of Nutrition and Dietetic Practice program, Bond University	Dietetics educator Clinical dietitian	Dietetics education Clinical nutrition Clinical trials Systematic reviews
Assoc Prof Sally Sargeant	Female	PhD, PGDipPsych	Chartered Psychologist (CPsychol), Australian Psychological Society (MAPS)	Deputy Head of School, School of Health & Human Sciences, Southern Cross University	Health professions educator Psychologist	Health professions education Qualitative research
Prof Linda Crane	Female	PhD, GradCert Educ, BSc (Hons)	N/A	Executive Dean (Acting), Faculty of Health Sciences and Medicine, Bond University	Health professions educator	Health professions education Graduate employability Physiology

### **3.3. Approach to the problem**

#### **3.3.1. Introduction**

Immersion in the scientific literature related to dietetics workforce preparation and preparedness in Australia was used to inform the approach taken and development of research questions contained in this thesis. This revealed that a comprehensive review of literature on the topic was required in order to understand existing evidence and evidence gaps. In addition, given the lack of published research on the topic, a series of exploratory studies were planned with key stakeholders who were well-positioned to provide in-depth insights into the phenomena of interest. As the researchers were located and experienced in dietetics workforce preparation in Australia, this determined the research setting and context for sampling participants as Australia. This approach is consistent with qualitative research, whereby the reader can determine if findings from one context can be transferable to other contexts or not. Evidence generated from this thesis provides a foundation for future action and research aimed at enhancing the preparation and preparedness of dietitians in Australia.

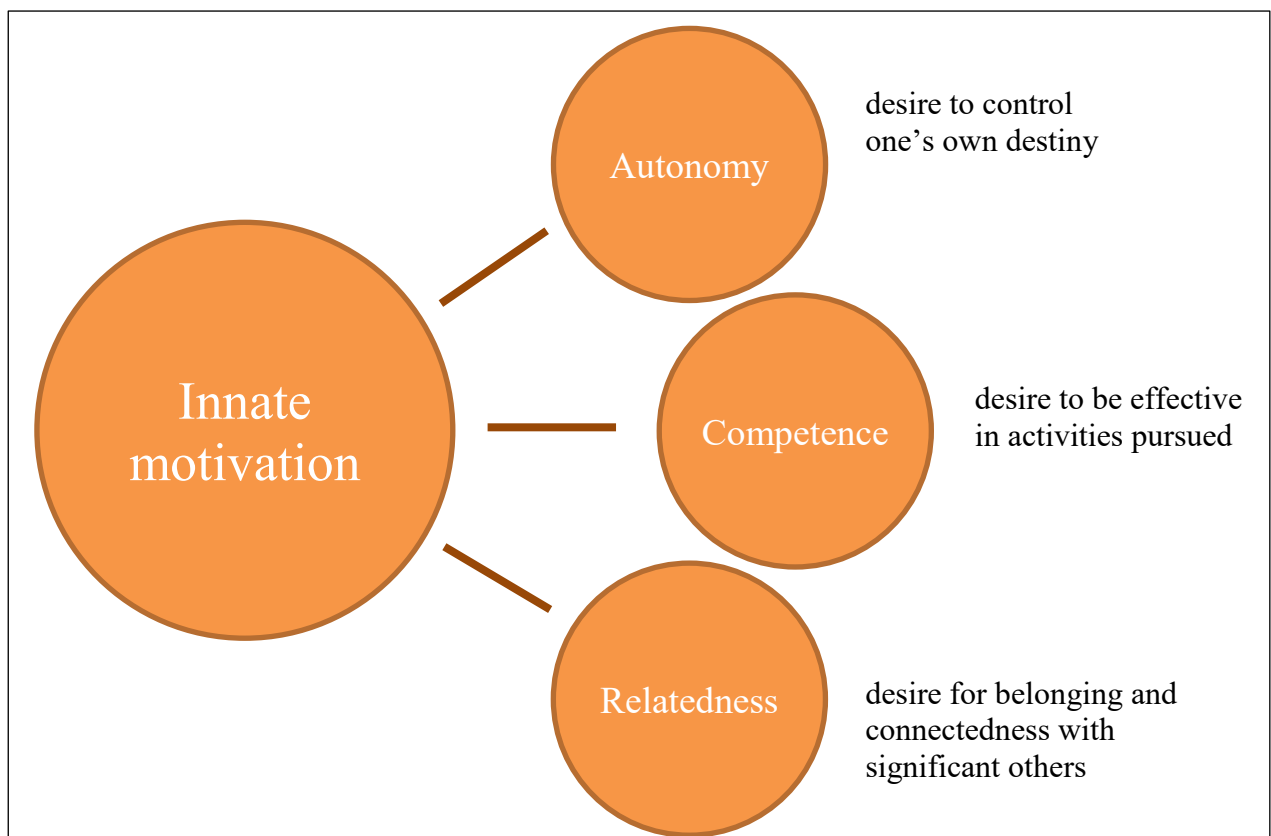
#### **3.3.2. Theoretical framework**

A theoretical framework is important to provide structure and supporting rationale for the steps taken in the research process.<sup>7</sup> It enables the problem, purpose, research questions and significance of the study/studies to be justified and interwoven.<sup>7</sup> By articulating the theoretical perspectives that underpin their research, health education researchers can enhance the transparency, quality and integrity of their work.<sup>8</sup> In this context, theoretical frameworks are not arbitrary. Rather they have been tested and validated by other researchers and recognized as accepted in the literature.<sup>7</sup>

One such framework is self-determination theory proposed by Ryan & Deci.<sup>9</sup> Self-determination theory provides a lens through which research findings can be viewed to help



understand the meaning behind, and motivations that drive, participants' behaviour.<sup>9</sup> This theory asserts that individuals are intrinsically motivated by their need for fulfilment being satisfied.<sup>9,10</sup> Further, an individual's motivation to learn, seek out challenges and optimally function, depends on the satisfaction of three innate, psychological needs being met – autonomy, competence and relatedness (Figure 3-1). On the contrary, when satisfaction of these needs is thwarted, individual's motivation is reduced.<sup>9,10</sup> In the case of this thesis, self-determination theory can help to understand the motivations and meaning that participants attribute to their experiences of dietetics workforce preparation and preparedness. Understanding key stakeholders' motivations can assist in creating contexts that support their desire to achieve optimal performance.



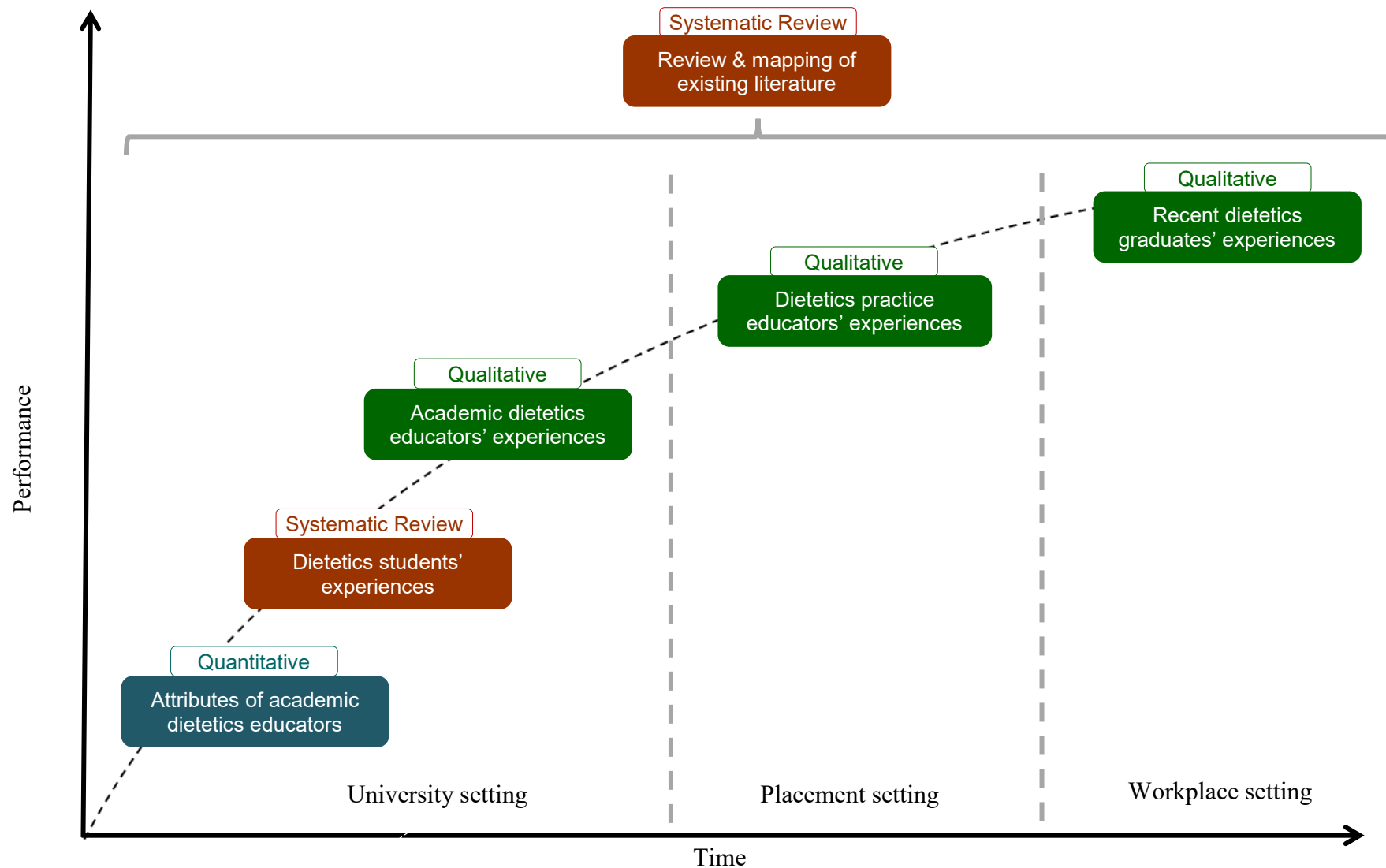
**Figure 3-1.** Key elements of the self-determination theory framework underpinning this thesis

### **3.3.3. Conceptual framework**

In addition to the theoretical framework that underpins this thesis, a conceptual framework conveys the researcher's understanding of how the research will be explored, the direction it will take and the relationship between different components of the research.<sup>7</sup> The framework used to conceptualise the series of studies aimed at addressing the research questions in this thesis is Khan & Ramachandran's curve of improving performance,<sup>11</sup> as described in Section 1.2.3. This model suggests that students in health professional education programs progress through a series of stages of professional development. Over time, their competence develops and performance improves as they engage in training and deliberate practice. For the purpose of this thesis, studies have been plotted against the stages of professional development through which individuals would progress in dietetics education programs (Figure 3-2). Given the typical format of dietetics education in Australia, the three dominant settings or contexts in which the phenomena of dietetics workforce preparation and preparedness can be experienced, include:

- the university setting;
- the placement setting; and
- the workplace setting.

That is to say, students experience their dietetics education program in the university setting which is followed by experiences in the placement setting before they become graduates and enter the workplace setting. It is assumed that the key stakeholders embedded in each of these settings will provide valuable insights into the phenomena of interest which will be central to informing the findings of this thesis.



**Figure 3-2** Conceptual framework guiding the six studies in this thesis (adapted from Khan & Ramachandran's curve of improving performance in healthcare<sup>11</sup>)

### **3.3.4. Qualitative research approach**

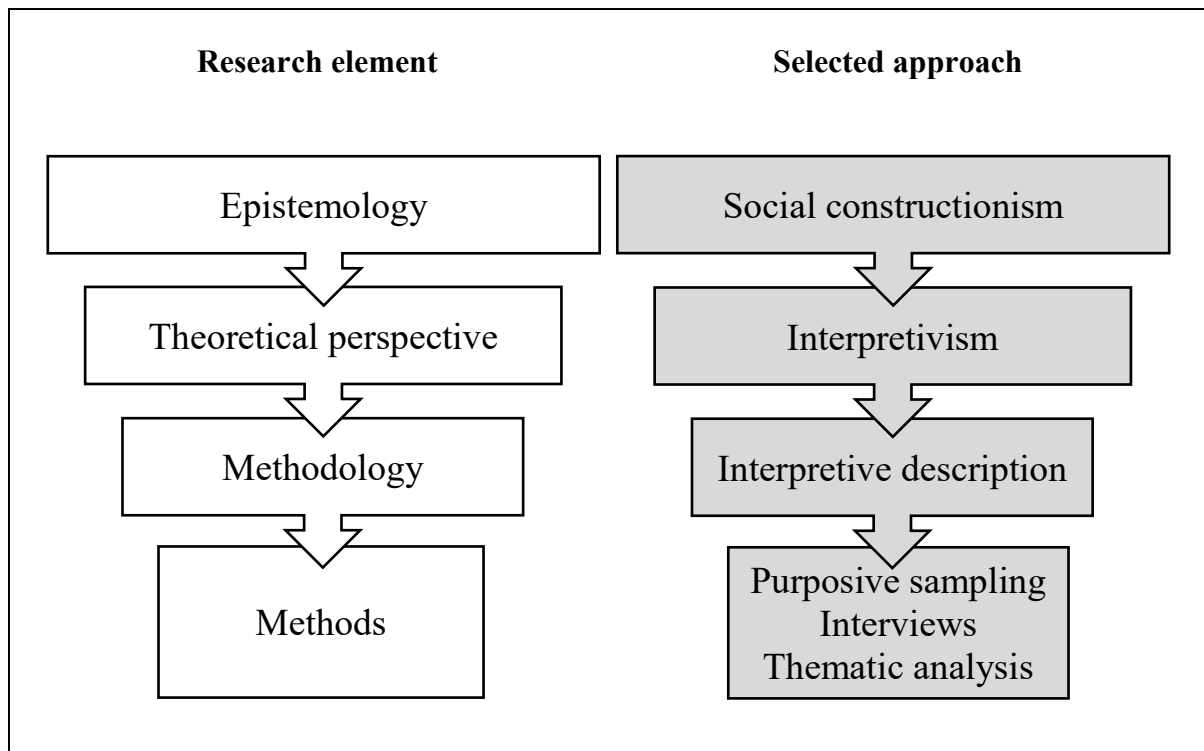
Qualitative research, the ‘science of words,’<sup>12</sup> is often used when there is little existing research on a topic. It is employed to elicit perspectives, beliefs, values and behaviours from individuals who have experienced a phenomenon of interest.<sup>13</sup> Through this, qualitative research helps researchers understand the meaning that individuals attribute to events and how individuals interpret social experiences that take place in naturally-occurring, real-life settings (e.g. workplaces).<sup>13,14</sup> The rich descriptions provided by participants in qualitative research offer valuable insights into phenomena under investigation, which are not possible to obtain through quantitative research.<sup>12,15</sup> Given this thesis aimed to explore the experiences of key stakeholders involved in dietetics workforce preparation and preparedness, a qualitative approach was appropriate. To further justify the approach taken, it is important to acknowledge the philosophical assumptions and elements that underpin the qualitative research methodologies selected to address the research aim.

While most research questions addressed in this thesis necessitated a qualitative approach, additional methods were required to appropriately address others. For example, to understand the size and composition of the academic dietetics educator workforce quantitative methods were required. The methods employed in such studies are described individually in manuscript form as per the Results sections in Chapters 5, 6 & 7.

### **3.3.5. Research design elements**

The design of the research and process to be undertaken in this thesis was guided by the four elements proposed by Crotty – epistemology, theoretical perspective, methodology and methods. These four elements represent hierarchical levels which are distinct yet interlinked – one level informs the next. They collectively frame the research process in order to address the research aim.<sup>16</sup> The four elements are related to the theoretical framework in that they

help to articulate the lens through which the researcher views the research – from the philosophical stance to the methods employed. The elements, along with the approaches selected in this thesis, are outlined in Figure 3-3 and described below.



**Figure 3-3** Research design elements and selected approaches taken (adapted from Crotty<sup>16</sup>)

### 3.3.6. Ontological position

Ontology refers to the study of what constitutes reality.<sup>12</sup> It asks the question ‘What is there to know?’<sup>14</sup> The researchers in this thesis took a relativist ontological stance which means subscribing to the belief that there is not one, single, objective reality. Rather, reality is a subjectively constructed account of the subjects and of the researcher.<sup>14</sup> In attempting to understand the experiences of others (i.e. study participants), the researchers acknowledged that their own subjectivities (values, beliefs, experiences) would influence the collection and interpretation of data provided.<sup>12</sup> For example, the researcher chose the questions to ask of

the participants and decided how the data would be interpreted and communicated. The importance of researchers being reflexive to acknowledge this influence (reflexivity) is described in Sections 3.4.6, 3.4.8 and 3.4.10. While ontology is considered superfluous by some as it emerges along with, and is therefore analogous to, epistemology,<sup>16</sup> it is a widely accepted construct in qualitative research.

### **3.3.7. Epistemological position**

Epistemology is concerned with the theory of knowledge and how knowledge is produced.<sup>12,14</sup> It attempts to answer the question ‘How do we know what we know?’<sup>15</sup> The social constructionist epistemological position adopted in this thesis, frames realities as socially constructed by the research participants through their use of language.<sup>12,14</sup> Social factors such as age, race, gender and culture shape an individual’s version of reality or knowledge.<sup>12</sup> Social constructionism embraces subjectivity as researchers are actively involved in the research process. Moreover, reality is considered to be a product of each participant’s own making and the individual context provided by each participant is valued.<sup>12</sup> In relation to this thesis, knowledge is a constructed account from each participant’s version of reality based on their social interactions with the world.

### **3.3.8. Theoretical perspective**

The theoretical perspective is the philosophical stance that provides a grounding of the researchers’ assumptions and informs the methodology.<sup>16</sup> An interpretivist theoretical perspective assumes that the realities constructed by individuals come from how they interpret and make sense of their experiences. Therefore, multiple truths or realities can exist and each of them are legitimate.<sup>12</sup> Such a stance requires a methodology that allows individuals to articulate their experiences and the meanings behind them.<sup>12</sup> In relation to this

thesis, multiple key stakeholders who have experienced a phenomenon may describe and interpret that experience differently, leading to the development of multiple realities.

### **3.3.9. Methodological approach**

In line with Crotty's proposed research elements, methodology refers to the strategy or design behind the choice and use of particular methods.<sup>16</sup> Two methodologies were used in this thesis to explore, describe and interpret the meaning that participants made of their experiences. Qualitative description was employed in the first of the qualitative studies exploring academic dietetics educators' experiences. This was appropriate given the primary researcher's experience at that early stage of the thesis. The methodology employed in the two subsequent qualitative studies (exploring dietetics practice educators' and recent dietetics graduates' experiences) was interpretive description.

Through qualitative description, researchers seek to provide a comprehensive summary of an individual's experience of a phenomenon.<sup>17</sup> Research employing a qualitative descriptive methodology may have influences from other paradigms or approaches (e.g. phenomenology, ethnography). However, qualitative descriptive studies require less interpretation and provide more 'straight' descriptions of the phenomena experienced by participants.<sup>17</sup> While qualitative description does not claim to be free from interpretation, it simply aims to minimize researcher inference. This enables researchers involved in the process to more readily reach an agreement on what participants have described about their experiences. Participants' descriptions of their experience must still demonstrate descriptive and interpretive validity. That is, a participant's account of their experience and the meanings that are attributed to that account must be accurate – accurate in the sense that most people, including the participants and researchers, would agree it accurately reflects the experience.<sup>17</sup>

Interpretive description extends upon qualitative description in that it requires researchers to move further into their data to provide some interpretation of the participants' experiences.<sup>17</sup> Originally developed in 1997,<sup>18</sup> this methodology enables complex phenomena experienced in applied health disciplines to be described and findings that are relevant to practice to be generated.<sup>19,20</sup> While conventional methodologies (e.g. phenomenology) require a high degree of researcher interpretation, interpretive description is less prescriptive. It encourages researchers to move beyond formal 'rules' imposed by traditional methodologies and towards a logical, relevant and meaningful approach that borrows from multiple paradigms to answer the research question.<sup>19</sup> For example, the approach taken in this thesis was imbued with influences from the phenomenology and grounded theory paradigms.<sup>21</sup> However, interpretive description is not exempt from theoretical underpinnings – rather it orients the research to an epistemological position that has purpose and direction.<sup>19</sup> Some of the key aspects of interpretive description include that it: examines individuals' experiences of a phenomenon to identify common themes and patterns, while allowing for individual variation; acknowledges that researchers bring their own knowledge and perspectives to the research; recognizes the value of multiple realities to enhance trustworthiness of findings; often employs one-on-one interviews and purposive sampling; and provides valuable and persuasive findings for experts in the field.<sup>20</sup> Given the above, interpretive description was selected as a valid and logical methodology for this thesis.

### **3.4. Methods**

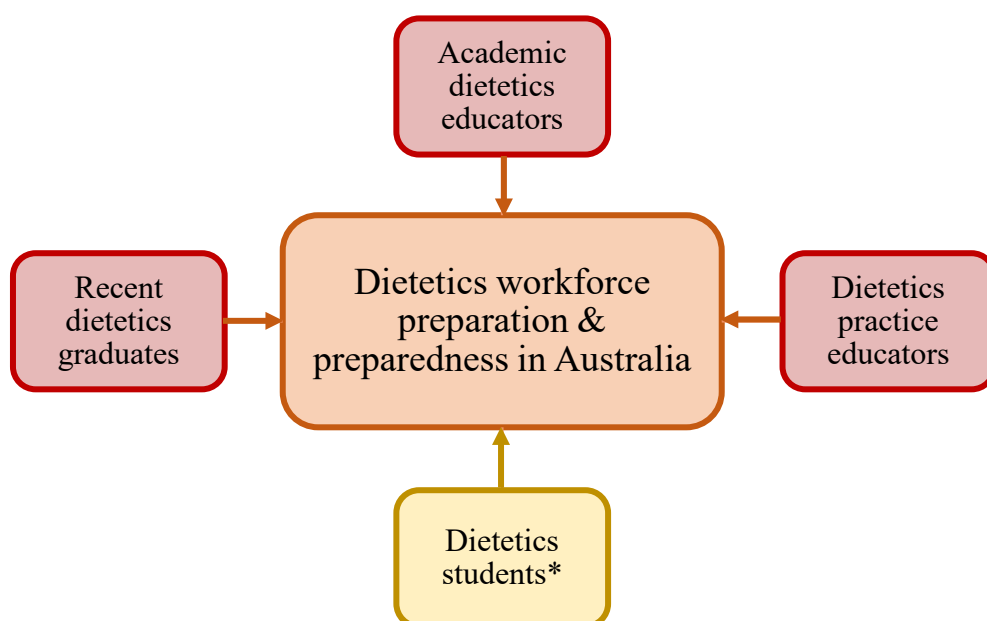
The methods refer to the techniques or procedures used to gather, manage and analyse data.<sup>16</sup> This includes all activities from sampling and data collection through to analysis. As outlined in Figure 3-3, the main methods employed in this thesis included purposive sampling,



interviews and thematic analysis. However, a detailed description of all methods utilized in the qualitative studies of this thesis are provided below.

### **3.4.1. Eligible participants**

The key stakeholder groups identified to address the research questions in this thesis are aligned to the conceptual and theoretical frameworks described in Section 3.3.2 and 3.3.3. Academic dietetics educators, dietetics practice educators and recent dietetics graduates who were embedded in university, placement and workplace settings respectively, were selected to explore the experience of dietetics workforce preparation and preparedness. In addition, the experiences of dietetics students were systematically synthesized from the existing literature to provide perspectives from this key stakeholder group (Chapter 8) (Figure 3-4). Eligibility criteria primarily focused on these key stakeholders having experienced the phenomena under investigation (Table 3-2). This was to ensure that participants were well-placed informants who were able to provide in-depth accounts of and valuable insights into their experiences.<sup>12</sup> Further, exploring a phenomenon from the perspectives of multiple different key stakeholder groups can add depth and diversity to the insights obtained and enhance the comprehensiveness of the findings (crystallisation).<sup>12,22</sup>



**Figure 3-4** Key stakeholder groups selected to describe their experience of dietetics workforce preparation and preparedness in Australia

**Table 3-2** Eligibility criteria for participants in each qualitative study of this thesis

Key stakeholder group	Academic dietetics educators	Dietetics practice educators	Recent dietetics graduates
Eligibility criteria	<p>Participants had to:</p> <ol style="list-style-type: none"> <li>1. be a dietitian</li> <li>2. be employed either part-time or full-time by an Australian university offering a dietetics education program; and</li> <li>3. be contributing to the education and/or preparation of dietitians for the workforce</li> </ol>	<p>Participants had to:</p> <ol style="list-style-type: none"> <li>1. be a dietetics practice educator affiliated with an Australian dietetics education program;</li> <li>2. be involved in preparing dietitians for the workforce (i.e. supervising or training dietetics students on placements); and</li> <li>3. have at least one year of experience as a dietetics practice educator</li> </ol>	<p>Participants had to:</p> <ol style="list-style-type: none"> <li>1. be a graduate of an accredited dietetics education program in Australia; and</li> <li>2. have completed their dietetics qualification within the two years prior to study commencement.</li> </ol>

In addition to these key stakeholders, it is recognized that dietetics students are well-placed to provide perspectives on their experiences of being prepared for the workforce. Given their lack of exposure to the workforce as a qualified practitioner and therefore a lack of context to reflect on their preparedness for practice, dietetics students were not selected as a key stakeholder group to investigate in this thesis. Rather, a qualitative synthesis of students' experiences was selected to highlight this group's views on being prepared as a dietitian for the workforce.

It is also acknowledged that additional stakeholders, such as employers of recent dietetics graduates and the patients/clients who receive the service of those recent graduates, could also provide insights into the phenomena of interest. However, including such stakeholders was outside the scope of this thesis. This was in recognition of evidence that the areas in which dietitians practice are increasingly diverse (as described in Section 1.4.7). It follows that employers of graduates and patients/clients would represent a similarly diverse and heterogeneous group with widely varied experiences. Further, these stakeholder groups may not be well-placed to comment on graduate preparedness for work in emerging areas (self-employed graduates working in private practice) or graduates who were not yet employed or working. Therefore, employers of graduates and patients/clients were not selected to provide their insights to inform this thesis.

### **3.4.2. Sampling**

In line with the social constructionist paradigm, individuals who could provide in-depth accounts of their experience of the phenomena of interest, and thereby help to address the research question, were purposively invited to participate in the study.<sup>12</sup> In purposive sampling, participants are selected based on a pre-determined criteria and are homogenous in that they have all experienced the phenomenon of interest.<sup>14</sup> It does not attempt to obtain a

sample that is representative of the whole population as findings are not intended to be generalizable.<sup>23</sup> Purposive sampling was used in conjunction with maximum variation sampling (a specific purposive sampling technique). This involved recruiting participants who were varied in their 1) areas of dietetics practice specialization; 2) experience levels; and 3) geographic locations across Australia.<sup>21</sup> Employing maximum variation sampling ensured that a diverse range of perspectives were captured and that the representation of one-sided views from participants was minimized.<sup>24</sup>

### **3.4.3. Sample size**

Sample size is not known prior to the commencement of data collection in qualitative research.<sup>23</sup> This is because it is impossible to know when the research question will be answered. Rather, the sample size is flexible and develops as data collection and analysis progresses. As opposed to sampling large numbers of participants, the focus is on obtaining in-depth insights through exploring information-rich participants until the research aim has been addressed.

Historically, sample size was determined when saturation was reached; that is, when no or few new themes emerged from participant data and concepts were consistently repeated or saturated.<sup>23,25</sup> Issues identified with saturation in health professional education research have led contemporary scholars to suggest it is problematic as a marker of quality in qualitative research.<sup>22</sup> Rather, explaining how samples are adequate (to enable transferability to other contexts), appropriate (in that they have addressed the study's aim through sampling well-placed informants) and aligned (with the researcher's theoretical stance) is preferred.<sup>22,26</sup> The point at which data collection ceased is described in Section 3.4.6.

Prior to study commencement, the number of participants required to answer the research aim in each study was estimated as 15. This estimate was loosely based on sample

sizes reported in similar qualitative studies<sup>25,27,28</sup> and studies in health care and health professional education.<sup>29 30</sup> This figure was dynamic in response to reaching the aforementioned point where adequacy, appropriateness and alignment could be justified. The numbers of participants interviewed in each study are provided below (Table 3-3).

**Table 3-3** Number of participants in each qualitative study of this thesis

Key stakeholder group	Academic dietetics educators	Dietetics practice educators	Recent dietetics graduates
	15	18	20

#### **3.4.4. Recruitment**

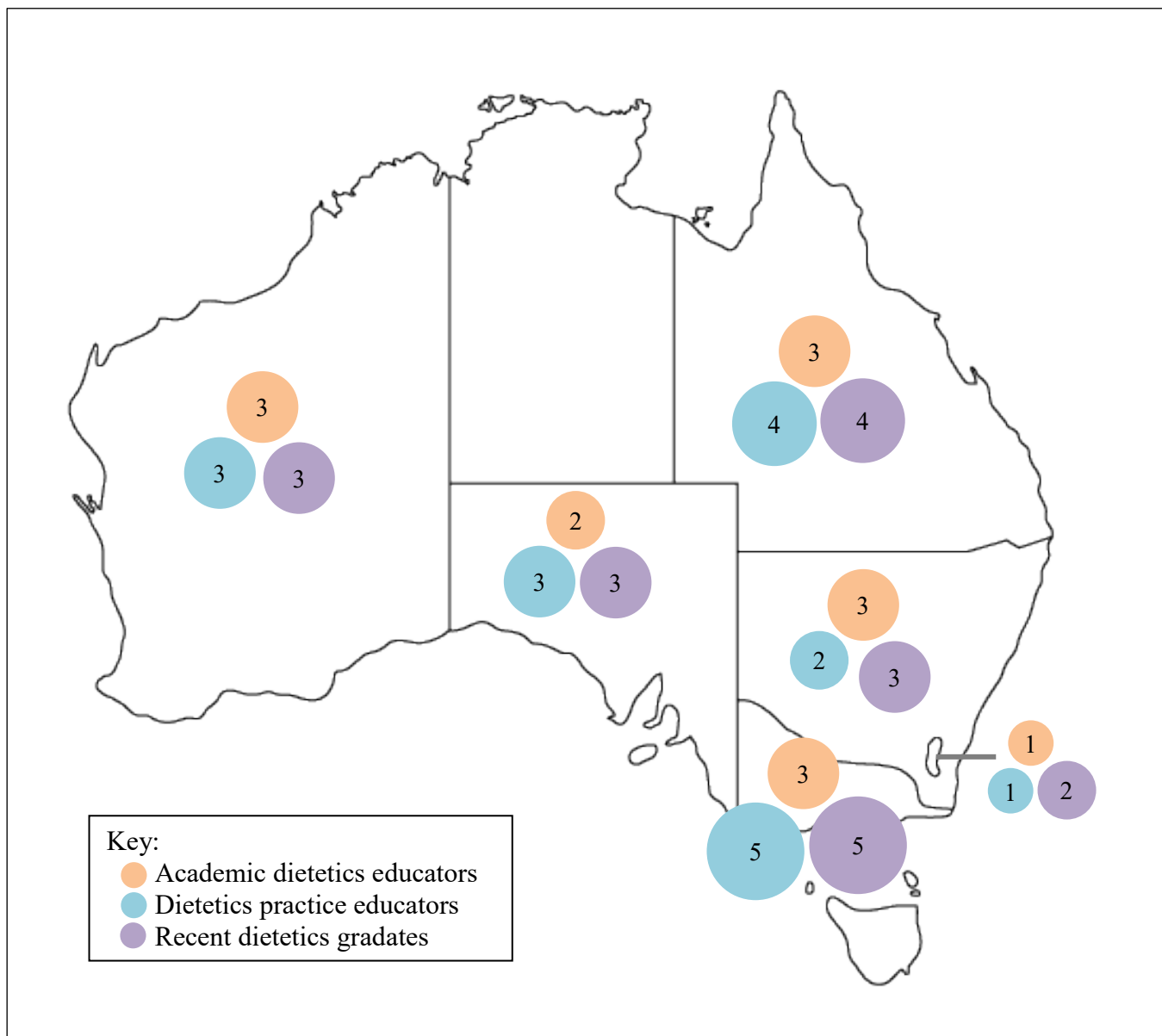
Recruitment strategies varied across each study in order to ensure that suitable participants were recruited (Table 3-4). This included recruiting through professional networks within the dietetics education sector in Australia as well as through electronic newsletters managed by the professional association. In all cases the primary investigator contacted potential participants. Participants/respondents were emailed an explanatory statement which provided ethical approval, outlined the study's aims, assured confidentiality/anonymity and confirmed eligibility criteria for participation. Participants were also assured that taking part was voluntary and that they could ask questions, stop the interview or withdraw their participation and data at any time. An interview guide showing examples of questions to be asked was also provided to participants. These steps ensured that participants understood the research process and any potential risks involved prior to participating and could therefore, provide their informed consent. Participants were asked to provide a copy of their signed informed consent and to nominate a time and date that suited for their participation in the study.

**Table 3-4** Strategies and professional networks used to recruit participants in each qualitative study of this thesis

Key stakeholder group	Academic dietetics educators	Dietetics practice educators	Recent dietetics graduates
	Emails sent by the primary researcher to potential participants who had participated in a previous study which profiled attributes of academic dietetics educators (Chapter 4)	Emails sent by the primary researcher to a professional network of dietetics educators who had established links with dietetics practice educators requesting nomination of potential participants	Electronic newsletters sent via professional association alerting members of the study and requesting potential participants to contact the primary researcher. Emails then sent to potential participants by the primary researcher

### 3.4.5. Setting

Due to the nature of the data collection method used (i.e. interviews), participants were not required to attend a particular physical location while the study was conducted. Further, in line with exploring the meaning that individuals attribute to social experiences, it is preferred that participants are studied in their natural setting (e.g. their workplace).<sup>15</sup> Once a time and a date were agreed as being suitable for both the participant and the primary researcher, participants were able to select the setting in which their interview took place (i.e. workplace, home). With the primary researcher based in Queensland and participants sampled from all states/territories across Australia, interviews took place primarily via telephone. There were few instances where participants were in close proximity to the primary researcher which enabled a face-to-face interview to take place. The numbers and geographical locations of participants from across Australia are provided below (Figure 3-5).



**Figure 3-5** Numbers and locations across Australia from which participants described their experience of dietetics workforce preparation and/or preparedness

### 3.4.6. Data collection

In-depth interviews, the most commonly used method in qualitative research,<sup>23</sup> were the enquiry method employed in this thesis. The interview guides used in each of the three qualitative studies were designed to elicit rich descriptions from participants about their

experiences. They were developed with input from experienced qualitative researchers in the research team with several iterations made before the interview was piloted. Interviews were piloted with one to two key stakeholders within each group who were well-placed to describe their experience of the phenomena. Pilot testing by the primary researcher allowed researchers to assess the effectiveness of the interview guide and enabled minor modifications to be made including to the sequence and wording of the questions.<sup>12</sup>

Interview guides were similar for each key stakeholder groups in that they broadly asked participants to describe their experience of dietetics workforce preparation and preparedness. The sequence and wording of questions was also similar. However, some variations were made to accommodate each stakeholder group's experience. For example, educators were asked to share their perspectives on how prepared graduates were for the workforce, while graduates were asked to describe how prepared they felt for the workforce. Questions were open ended to encourage participants to respond freely and without being led by the interviewer.<sup>23</sup> Open-ended questions were also applied in line with inductive reasoning that supports the social constructionist approach. In this process, data are used to generate insights and meaning rather than for testing a pre-determined hypothesis or theory.<sup>4</sup> The guide was ordered to enhance conversational flow.<sup>24</sup> Interviews commenced with more general, introductory questions such as 'Can you describe your pathway into studying nutrition and dietetics?' As the interviews progressed and rapport developed, more specific, direct questions were asked, such as 'How well prepared did you feel as a dietitian entering the workforce?' The final interview guides used in each study consisted of seven to ten open-ended questions (Table 5-1, 6-1 and 7.1).

The purpose of interviews is to see another individual's perspective or version of reality, and assumes that their perspective can offer meaningful insights into the phenomena being studied.<sup>24</sup> Using one-on-one, in-depth, semi-structured interviews aligned with the



theoretical position assumed by the researchers in this thesis – that key stakeholders can provide rich, deep accounts of their experiences which enables researchers to understand the meaning behind those experiences and generate relevant findings.<sup>12,23</sup> While the interview guide enhanced consistency within groups,<sup>24</sup> the semi-structured format allowed flexibility in the order and phrasing of each question and enabled the interviewer to probe, expand on or clarify questions and to elicit additional information as required.<sup>31</sup> For example, if a participant was unsure what was meant when asked to describe their experience of dietetics workforce preparation, the interviewer probed them by asking for overall thoughts on their experience of being prepared as a dietitian, as well as examples of the best, worst and most memorable aspects. All interviews were conducted by the primary researcher to minimize variation between interviews.<sup>24</sup>

Prior to the in-depth questions being asked, the interviewer provided a brief outline of the study and participants were asked to verbally confirm their informed consent. To help develop rapport, the interviewer briefly discussed her professional background as well as the rationale behind conducting the study.<sup>14</sup> In addition, active listening was demonstrated by re-stating and incorporating some of the participants' comments throughout the interview.<sup>14</sup> For example, 'You mentioned X was a challenge for you. Can you elaborate on how X was a challenge?' Participants were encouraged to ask questions before and during the interview. At the completion of each interview, participants were thanked for their contribution to the scholarship and encouraged to ask any final questions related to the study. Data on participant characteristics was also collected in order to consider transferability of the study findings to other groups, contexts and settings.<sup>12</sup> Full characteristics of the key stakeholders who participated in the qualitative studies in this thesis are provided in Tables S5-1, S6-2 and 7-2. Field notes (documentation of the interviewer's initial thoughts and relevant participant perspectives made during the interview) were taken by the primary researcher throughout and

immediately following each interview. This enabled significant perspectives to be highlighted for consideration in later analysis and enhanced confirmability of participant's accounts.<sup>23,32</sup>

In line with Dey's view, the point of theoretical sufficiency was reached when sufficient data enabled the 'answers' to be understood and developed into themes to illustrate the 'story'.<sup>22,33</sup> At this point, researchers considered that addition of new data would not modify or alter the themes identified. Researchers agreed that no further data would be collected until analysis confirmed that the research question had been sufficiently addressed. The term sufficiency indicates that the pooled data is 'good enough' or adequate rather than attempting to reach the unattainable point of exhaustion as described by proponents of saturation.<sup>22</sup> While researchers begin to identify patterns of meaning during the data collection stage,<sup>34</sup> it was during data analysis that pooled data was deemed adequate, appropriate and aligned with the researchers' position and for addressing the research aim.

Based on similar research, participants were advised that interviews would have a duration of approximately thirty to sixty minutes. No time limits were placed on the interviews to allow participants to describe their experiences without perceived constraints. On average, interviews lasted for between 36 to 64 minutes (Table 3-5).

**Table 3-5** Duration of interviews for each stakeholder group

Key stakeholder group	Academic dietetics educators	Dietetics practice educators	Recent dietetics graduates
Average duration (minutes)	64 (range: 38-100)	45 (range: 24-64)	36 (range: 26-60)

### **3.4.7. Data management**

Interviews were recorded on a digital voice recorder as a means of capturing an accurate account of the participants' experience and the verbal interaction between interviewee and interviewer.<sup>23</sup> Each interview was then transcribed verbatim into Microsoft Word as a written record of the subject's experience to enable full analysis.<sup>14</sup> The primary researcher transcribed all interviews for the academic dietetics educator study and a professional transcription service was used to transcribe the de-identified audio recordings for the remaining two qualitative studies. Prior to analysis, the primary researcher listened to each audio recording and checked the accuracy of each transcribed interview. Following review of each transcription, the primary researcher typed written memos (perspectives that are more reflective and analytical than field notes) to track their thoughts on each stakeholders' insights and to aid analysis.<sup>12</sup> Verbatim transcribing and accuracy checking of each transcript negated the need for member checking (requesting participants to verify the transcript from their interview).<sup>22</sup> To protect participant confidentiality, all files relating to the studies, including interview recordings, were stored in a password protected file and/or a locked filing cabinet which was only accessible to the primary researcher. Files were shared with members of the research team where required (e.g. deidentified transcripts were provided to other researchers for analysis).

Data were primarily managed using NVivo software (Version 10 and 11).<sup>35</sup> As computer-assisted qualitative data analysis software (CAQDAS) program, NVivo enables qualitative researchers to store, organise, search, retrieve and code large volumes of text in an efficient manner.<sup>12</sup> Files can be shared among members of the research team to facilitate collaboration throughout the coding and analysis process. Transcripts of participant interviews were imported into NVivo as Word documents and converted to NVivo files. Once coding was complete (as described in Section 3.4.8 below), codes were exported from

NVivo into Microsoft Word files then printed and individually sectioned to enable visual mapping in analysis.

#### **3.4.8. Data analysis**

Analysing data obtained in the qualitative studies of this thesis was conducted using two accepted methods – thematic analysis (as developed by Braun and Clarke<sup>34</sup>) was applied in conjunction and as required with template analysis (as developed by King<sup>36</sup>).

Thematic analysis is an approach to analysing qualitative data which involves searching across a data set to identify repeated patterns of meaning (themes). The six phases of thematic analysis include 1) becoming familiar with the data; 2) generating initial codes; 3) searching for themes; 4) reviewing themes; 5) defining and naming themes; and 6) producing a report (Figure 3-6).<sup>34</sup> In familiarizing oneself with the data (phase 1), the primary researcher listened to each interview recording and read each transcript multiple times and made initial notes on participants' perspectives. Familiarization was also achieved by transcribing each interview and/or checking each transcript for accuracy. Initial codes (labels attached to a segment of data) were generated when sections of data were deemed interesting, significant or relevant to answering the research aim (phase 2). Open coding, whereby data are broken down into concepts and given discrete labels to enable new relationships to be formed across the data set,<sup>23</sup> was performed by the primary researcher for all fifty-three transcripts in this thesis. A coding library in NVivo was established once all interviews within each key stakeholder group had been coded. Other members of the research team were able to access and review the coding library, including codes assigned to data segments, as developed by the primary researcher. As described in Section 3.4.7 above, all codes were exported from NVivo into Microsoft Word documents for the subsequent stages of analysis.

To initiate the identification of themes (broad units of information comprised of multiple codes aggregated to form a common notion)<sup>21</sup> (phase 3), the process of visually mapping codes into related groups was achieved by affixing codes onto a wall. Through a series of meetings between researchers (KM & DR), codes were moved around and combined into clusters which had a shared meaning and represented a potential theme. These potential themes were revisited and re-worked multiple times until researchers were satisfied that preliminary themes had been developed from the data set and a thematic map was created (Phase 4). Following this, the researchers were able to refine and name the main or overarching themes and the sub-themes that sat within them (Phase 5). A small number of codes which did not seem to ‘fit’ within any of the themes were set aside from the thematic map. Researchers discussed each theme and subtheme identified, to articulate their interpretation of the ‘essence’ or the meaning behind it. Before the themes and subthemes were finalized, a third researcher (SS) was engaged to cross-check the other researchers’ interpretations against a subset of data (i.e. 3-5 transcripts that were selected to provide a diverse range of perspectives). The report (i.e. manuscript) was then produced (Phase 6). While the report aims to express the patterned meaning developed from the data, it also enables divergence and different perspectives to be captured and illustrated through participant quotes.



**Figure 3-6** Phases of thematic analysis employed to develop themes and subthemes for each study (adapted from Braun and Clarke<sup>34</sup>)

Throughout the analytical process, researchers were cognizant of identifying ‘true’ themes through thematic analysis as opposed to creating categories via content analysis. Using these methodological terms interchangeably and blurring the boundaries between these two approaches is a common phenomenon in qualitative research.<sup>37</sup> The research team discussed the difference between themes and categories and agreed with Morse’s interpretation – that “a category is a collection of similar data sorted into the same place” whereas a theme is “a meaningful essence that runs through the data”.<sup>38</sup> Where categories are

important to answer “What” is in the data, a theme aims to elicit the meaning a participant has attributed to the experience by answering “What is this data about?”<sup>38</sup> Therefore, the themes identified throughout the qualitative studies in this thesis, are not simply a quantified aggregation of the most commonly reported participant experiences. Rather, they reflect the researcher’s interpretation of the meaning behind participant experiences that ran throughout entire participant data sets. Researchers also employed the use of gerunds (a verb that functions as a noun, ending in *-ing*) in developing themes. Gerunds provide richness and a sense of action while enhancing the meaning behind participant’s experiences.<sup>39</sup>

In addition, the concept of themes ‘emerging’ from the data was avoided in favour of themes being identified and developed by the research team. This strategy reflexively acknowledges the inherent and active role of the researchers in data analysis and indicates transparency to readers.<sup>22</sup> Participant validation (asking participants to validate the researcher’s interpretation of their data) was not aligned with the social constructionist approach in this thesis and was therefore not employed.<sup>14</sup> This was also in recognition of the fact that the researcher’s interpretation is of participants’ collective experiences throughout the entire data set, not simply one participant’s experience.<sup>22</sup> Further, data analysis took an inductive approach whereby researchers derived patterns and themes from their interactions with and interpretations of the data.<sup>14,24</sup> A deductive approach which aims to analyse data against an existing theory or hypothesis,<sup>24</sup> was not aligned with the theoretical position taken by researchers in this thesis.

Applying the concept of saturation (reaching the point where themes are consistently repeated and the addition of new data would not yield new themes<sup>23</sup>) has been widespread in health professional education research.<sup>22</sup> The qualitative research in this thesis was not attempting to reach a point of saturation during the data analysis stages. Rather, researchers were aiming to address dimensions of the research to indicate a logical point of sufficiency,

as recognized in more contemporary literature.<sup>22</sup> That is, researchers were satisfied that the pooled data were adequate enough to enable transferability to other contexts, appropriate enough to address the research aim and well-aligned with the theoretical orientations and philosophical approach taken in the research.<sup>22</sup> Given that the data analyzed satisfied these dimensions, no new data were collected for subsequent analysis in the qualitative research conducted in this thesis.

To enhance the consistency of the analysis across studies, the same three members of the research team analyzed the data. Two researchers (KM & DR) led the analysis and developed preliminary themes. These were then cross-checked by a third researcher (SS) who reviewed a subset of transcripts and provided their perspectives on the themes. This method of auditing or multiple coding which involves the ‘independent’ third researcher cross-checking the other researchers’ interpretations of the data<sup>40</sup> enhances interpretive validity (meanings attributed by participants).<sup>17</sup> It is not a complete repetition of coding and analyzing the entire dataset, and thus an attempt to replicate the other researchers’ results. Rather, engaging multiple researcher perspectives is a valuable strategy to provide divergent views and/or corroborate the emergent findings.<sup>22,40</sup> Moreover, including multiple researcher perspectives through triangulation in an attempt to converge on a ‘right’ or ‘valid’ answer was not the intention of researchers involved in this thesis. Rather, multiple researcher perspectives were included to add diversity, comprehensiveness and richness to the findings generated through data analysis.<sup>22</sup>

In qualitative research, researchers are instruments in the research process who bring with them their own experiences, values, beliefs and interests.<sup>14</sup> Through reflexivity, researchers acknowledge how these attributes and their positionality may influence the analysis of data and therefore the research findings. That is, researchers must demonstrate an awareness of how they are inherently involved in the research and that they are contributing



to the construction of themes and meaning to shape the research findings.<sup>14</sup> The principles of qualitative teamwork and being reflexive as a team were applied by the researchers in this thesis.<sup>41</sup> In addition to acknowledging their positionality at the commencement of the research (as outlined in Section 3.2), communication between the research team during data analysis enhanced reflexivity. The research team were clear about their roles, the contribution they could make and the process to be undertaken prior to data analysis proceeding while also accepting that the research process is fluid and evolving. The two researchers who led the analysis (KM & DR) were closely located and met frequently (at least weekly) to initiate, progress and finalise the themes identified from the data. Following data collection, researchers engaged in discussions to articulate the main patterns that were becoming apparent from the participants' experiences. Input and guidance were sought from and provided by another experienced qualitative researcher on the team (SS) as required. For example, this researcher introduced the accepted method of template analysis (described below) in response to the other researchers' concerns about how findings from previous studies would influence that of subsequent studies. Reflexivity was evident through the robust and in-depth discussions between researchers while themes were being developed and identified. Researchers challenged and supported each other on how and why codes should be grouped together, what themes meant and why subthemes belonged within broader themes. Being close to the data enabled researchers to recall individual participant experiences to help support their perspectives on the meaning behind emerging themes. In addition, memos were kept by the primary researcher as themes were developing for later reflection and consideration. Memoing is recognized as a valuable audit trail to document the researchers' thinking processes and development of ideas throughout data analysis.<sup>21</sup>

Given the similarities and subsequent nature of the qualitative studies in this thesis, template analysis was an additional strategy used by researchers to enhance reflexivity. That

is, template analysis was used for both the dietetics practice educators and the recent dietetics graduates studies following the academic dietetics educators' study. Template analysis, described as a form of thematic analysis, aims to formalize the assumptions that researchers bring from previous research projects.<sup>42</sup> In this technique, *a priori* themes previously developed in a similar study/studies are used as a template to initiate the analytic process with a subset of data (e.g. five out of fifteen participant transcripts). The themes are then progressively modified as analysis of all data (i.e. all fifteen participant transcripts) proceeds and new themes arise.<sup>42</sup> This acknowledged and addressed the researchers' assumptions around themes developed in first study, which likely influenced the subsequent two studies, while enabling new themes to be constructed.<sup>42</sup> The analytic methods employed across studies in this thesis are provided below (Table 3-6).

**Table 3-6** Methods applied for data analysis in each qualitative study

Key stakeholder group	Academic dietetics educators	Dietetics practice educators	Recent dietetics graduates
	Thematic analysis	Thematic analysis & template analysis	Thematic analysis & template analysis

### 3.4.9. Reporting

Systematic and comprehensive reporting of qualitative research is essential to enhance transparency and improve the value of the research findings.<sup>43</sup> Reporting guidelines help researchers articulate and help readers to better understand and critically appraise the research undertaken.<sup>2</sup> Two guidelines were used to inform the reporting of research in the qualitative studies in this thesis – qualitative research review guidelines – RATS (RATS)<sup>44</sup> and

Standards for Reporting Qualitative Research (SRQR) guidelines.<sup>43</sup> Both RATS and SRQR are endorsed by an international authority on reporting guidelines.<sup>45</sup>

The reporting of the first qualitative study in this thesis (academic dietetics educators experiences) was guided by the RATS qualitative research review guidelines.<sup>44</sup> The RATS guidelines have been widely used in health research and offer a checklist for critiquing aspect of qualitative research as adequate/appropriate or inadequate/inappropriate against 22 criteria (see Table S5-2). This was appropriate given the primary researcher's experience at that early stage of the thesis. In the two subsequent qualitative studies (exploring dietetics practice educators' and recent dietetics graduates' experiences) reporting was in line with the SRQR guidelines.<sup>43</sup> The SRQR guidelines are a contemporary synthesis of recommendations for reporting qualitative research (see Table S6-1 and S7-1). By addressing 21 items, readers are provided with more complete information which enhances the overall quality of studies.<sup>43</sup> The reporting guidelines employed across studies in this thesis are provided below (Table 3-7).

**Table 3-7** Guidelines used to inform reporting in each qualitative study

Key stakeholder group	Academic dietetics educators	Dietetics practice educators	Recent dietetics graduates
	RATS	SRQR	SRQR

### 3.4.10. Demonstrating rigour

Qualitative research is increasingly valued in health and health professional education research.<sup>22</sup> However, in the past it has been criticized for its perceived shortcomings, which are often the result of comparisons to quantitative research.<sup>46</sup> Despite quantitative concepts

for displaying rigour being recognized as incompatible for their research, qualitative scholars began adhering to a more positivist approach (that there is one single truth or reality) in an attempt to demonstrate the legitimacy of their work.<sup>22</sup> The development of checklists to improve rigour have been shown to improve qualitative research. However, they too have been criticised for being applied in an uncritical and non-reflexive manner.<sup>40</sup> More recently, qualitative researchers have been encouraged to critically reflect on their epistemological standpoints and the application of rigour-enhancing strategies, rather than simply reporting that ‘accepted’ strategies were applied without justifying how and why.<sup>22</sup>

Demonstrating steps taken to enhance the quality and rigour of qualitative research is important if findings are to be considered, accepted and applied in practice. The strategies employed to ensure that quality and rigour was embedded throughout the qualitative research in this thesis has been described in the sections above and in the relevant manuscripts (Chapters 5, 6 & 7). However, a summary of these strategies and the element of rigour they aimed to ensure is provided below (Table 3-8), noting that the application of a strategy can enhance rigour in multiple ways.

**Table 3-8** Summary of strategies employed to enhance rigour and quality in this thesis

Element	Description/purpose of element	Strategies employed to enhance rigour
Confirmability	Findings are derived from participant data and not simply a product of the researchers’ perspectives <sup>23</sup>	Field notes Memos Voice recordings Transcripts Reflexivity
Descriptive validity	Participants accounts of their experiences are generally recognized as accurate <sup>17</sup>	Voice recordings Transcripts

**Table 3-8 (continued)**

Credibility	Findings are an authentic representation of participants' collective experiences and can be trusted <sup>23</sup>	Multiple researcher perspectives Transcript auditing Purposive sampling Voice recordings Transcripts
Interpretive validity	The meanings attributed to participants' experiences are generally recognized as accurate <sup>17</sup>	Multiple researcher perspectives Transcript auditing
Dependability	Findings are consistent and congruent with data collected; clear and transparent links are shown between the data collected and meanings attributed to it <sup>23</sup>	Voice recordings Transcripts Reflexivity Memos Descriptive methods Multiple researcher perspectives
Transferability	Findings can be applied to other groups in other contexts and settings <sup>23</sup>	Purposive sampling Maximum variation sampling Descriptive methods

In addition, Willig also cites guidelines for demonstrating quality and conducting 'good' qualitative research. These include the importance of fit; integration of theory; comprehensive documentation; owning one's perspective; and grounding findings in examples.<sup>14</sup> Each of these aspects have been addressed throughout Chapter 3 and the subsequent studies that comprise this thesis.

### 3.5. Overview of studies

Table 3-9 provides an overview of the research studies conducted for this thesis including target group, setting and research questions addressed.

**Table 3-9** Overview of studies conducted for this thesis

<b>Study</b>	<b>Design</b>	<b>Participants/ Population</b>	<b>Phenomena of Interest</b>	<b>Context/Setting</b>	<b>Research question</b>
1. Review of dietetics workforce preparation and preparedness research in Australia	Systematic review – literature mapping	Studies regarding dietetics workforce preparation & preparedness in Australia	Dietetics workforce preparation & preparedness in Australia	Universities, placement sites, and workplaces in Australia	What research has been conducted on dietetics workforce preparation and preparedness in Australia?
2. Professional attributes of academic dietetics educators in Australia	Quantitative – cross sectional survey	Academic dietetics educators	Dietetics workforce preparation & preparedness in Australia	Universities in Australia	What is the size and composition of the academic dietetics educator workforce in Australia?
3. Experiences of academic dietetics educators in Australia	Qualitative – qualitative description	Academic dietetics educators	Dietetics workforce preparation & preparedness in Australia	Universities in Australia	How do academic dietetics educators describe their experience of dietetics workforce preparation and preparedness in Australia?
4. Experiences of dietetics practice educators in Australia	Qualitative – interpretive description	Dietetics practice educators	Dietetics workforce preparation & preparedness in Australia	Placement sites in Australia	How do dietetics practice educators describe their experience of dietetics workforce preparation and preparedness in Australia?
5. Experiences of recent dietetics graduates in Australia	Qualitative – interpretive description	Recent dietetics graduates	Dietetics workforce preparation & preparedness in Australia	Workplaces in Australia	How do recent dietetics graduates describe their experience of dietetics workforce preparation and preparedness in Australia?
6. Experiences of dietetics students	Systematic review – qualitative synthesis	Dietetics students	Dietetics workforce preparation & preparedness	Universities and placement sites	How do dietetics students describe their experience of dietetics workforce preparation and preparedness?

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## **Chapter 4. Professional Attributes of the Academic Dietetics Educator Workforce**

## 4.1. Preface

This chapter provides a profile of the emerging academic dietetics educator workforce in Australia. Academic dietetics educators – dietitians in the university setting who educate, train and prepare dietetics graduates for the workforce – are integral to shaping the future profession.

A review of the literature indicated that while research has been conducted around other key stakeholders, including dietetics practice educators and dietetics students, evidence regarding this important workforce group was lacking. In particular, the size and composition of the academic dietetics educator workforce in Australia had not been published. A cross-sectional survey to enumerate and describe the professional attributes of the core academic dietetics educator workforce in Australia was therefore necessary.

Data collected in this study were also used to inform and recruit participants for the subsequent qualitative study regarding academic dietetics educators' experiences of workforce preparation and preparedness (Chapter 5).

This chapter contains the accepted version of an original manuscript published in a peer-reviewed journal. The formatting of this manuscript is consistent with the thesis style. References for this manuscript appear at the end of the chapter and supplementary tables and figures appear as appendices at the end of the thesis.

Citation: **Morgan, K**, Hughes, R. Professional attributes of the emerging academic dietetics educator workforce in Australia. *Nutrition & Dietetics* 2016, **73**: 275-282. <https://doi.org/10.1111/1747-0080.12238>

## **4.2. Abstract**

### **4.2.1. Aim**

To describe the size and demographic, education, experience and practice attributes of the core academic dietetics educator workforce in Australia.

### **4.2.2. Methods**

A self-administered, cross-sectional survey was electronically distributed to academic dietetics educators at 18 Australian universities offering dietetics education programs. Data from survey responses were collated and descriptively analysed.

### **4.2.3. Results**

From a total sample frame of 147 academic dietetics educators identified by websites, responses were received from 91 eligible individuals (response rate = 62%), with at least one participant from each university offering a dietetics program in Australia. The sample was not representative of more senior academic dietetics educators, and therefore the core academic dietetics educator workforce. Rather, the sample was typically female aged 30–39 years with a Lecturer level, full-time appointment who cited clinical dietetics as their main area of practice specialisation. Around half of the sample had yet to complete a PhD and had five years or less of experience working as a dietetics educator or a dietetics researcher.

### **4.2.4. Conclusions**

The findings were limited to emerging academic dietetics educators due to the non-participation and underrepresentation of more credentialed educators. The sample was relatively young and inexperienced in dietetics education and research. This may reflect the rapid expansion of dietetics education programs in Australia over the past decade and limited workforce surge capacity. Nevertheless, the data reflect a small workforce group with the

capacity to significantly influence future dietitians. Ongoing research and workforce development strategies are required to support the dietetics educator workforce and further enhance dietetics workforce preparation in Australia.

#### **4.2.5. Keywords**

Dietetics, education, student, university, workforce

### 4.3. Introduction

Developing a health workforce that meets the healthcare needs of those it serves has been declared a national priority.<sup>1</sup> With its key purpose to contribute to promoting health, preventing disease and treating illness by optimising nutrition intakes,<sup>2</sup> the dietetics workforce should be well-placed to advance the nutrition-related health of individuals, communities and populations in Australia. However, a lack of good information exists regarding the size, composition and professional attributes of the Australian dietetics workforce.<sup>3</sup>

As a non-registered, self-regulated health profession, dietetics does not benefit from the nationally-consistent and coordinated data collection service offered under the National Registration and Accreditation Scheme (NRAS).<sup>4</sup> Over the past twenty years, attempts have been made by researchers to enumerate and profile the professional attributes of sectors of, or the entire, dietetics workforce in Australia.<sup>5-10</sup> More recently, a national authority noted significant discrepancies between data sources used when attempting to describe characteristics of the dietetics workforce.<sup>3</sup> Extrapolation of membership data from the Dietitians Association of Australia (DAA) suggested that in 2014 the size of the Australian dietetics workforce was in excess of 6000.<sup>11,12</sup> Having limited data to capture a comprehensive picture of the Australian dietetics workforce is a significant barrier to effective workforce development and planning for this profession.

Health workforce preparation is acknowledged as a critical step in the workforce development needed to respond to the health challenges facing Australia.<sup>1,13</sup> Health professional educators play a central role in this process.<sup>14</sup> The role of preparing dietitians for the workforce is largely assumed by academic dietetics educators. However, it is acknowledged that others such as biomedical scientists, psychologists and statisticians also contribute. For the purpose of this study, an academic dietetics educator is defined as a dietitian employed by a university who actively engages in the practice of educating and preparing entry-level dietitians



for the workforce in the university setting. As key stakeholders in dietetics workforce development, academic dietetics educators have the capacity to significantly influence future dietitians during the formative stages of their professional development.<sup>15,16</sup>

The expansion of the dietetics education sector over the past decade associated with growth in the number of university dietetics education programs in Australia,<sup>11</sup> has resulted in an apparent parallel expansion in the number of dietitians employed in academic settings. The extent of this expansion, the attributes of this workforce and the associated workforce development challenges in this workforce group have been largely unexplored. The aim of this study was to describe the core academic dietetics educator workforce in Australia by profiling the size, demographic, education, experience and practice attributes of dietetics educators employed in dietetics workforce preparation programs in Australian universities.

#### **4.4. Methods**

Ethics approval was obtained from the Bond University Human Research Ethics Committee. A list of Australian universities offering dietetics education programs that were either currently accredited or seeking accreditation was obtained from the Dietitians Association of Australia (DAA) website.<sup>17,18</sup> Publicly-available online staff directories on those universities' websites were reviewed to collate a draft list of academic dietetics educators. To limit the effect of outdated website information, this list was verified and updated by email or telephone correspondence with either the head of the nutrition and dietetics department, an academic dietetics educator or an administrative staff member in the relevant university department. To be eligible for inclusion in the study, the subject had to be a dietitian who was employed by the university on either a part-time or full-time basis and who self-identified as currently (or recently) contributing to the education and/or preparation of dietitians for the workforce.

Respondents that were identified as not being dietitians and those who indicated they were employed on a sessional or ‘as required’ basis were excluded.

A profiling survey instrument with forty items addressing demographic, employment, education, experience and practice attributes was developed by the research team (Table S4-1). Each item posed a closed question and provided a number of pre-defined options (range: 2-15) for the subject to select from. An ‘additional information’ field was provided to allow subjects to input their own data if they deemed that none of the pre-defined options were suitable. A professional profile was pre-populated with data for each identified academic dietetics educator using information available on university websites. The survey instrument was process piloted with two experienced academic dietetics educators who were not part of the research team, including one with experience in dietetics education research, to ensure procedural feasibility and to limit question ambiguity. Minor edits were made to some of the response options based on pilot feedback.

Subjects were emailed their draft professional profile survey instrument (using data from publicly-available sources) and invited to participate in the study if they self-identified with the inclusion criteria. They were then asked to complete their individual instrument and return it electronically. The email also provided the subjects with an explanatory statement including assurance of confidentiality and details of the research team. Reminder emails were sent approximately two weeks after the initial invitation was sent with a final reminder sent at approximately four weeks after the initial invitation. Informed consent was obtained by the participants choosing to complete and return their profile. Data collection ceased in March 2014.

Respondent’s professional profiles were reviewed upon their return and data was checked and amended for obvious data entry errors to enable consistent collation and subsequent analysis. Where returned survey instruments were incomplete or unable to be

viewed by the primary investigator, participants were asked to clarify or re-submit their responses. Data collated from the entire respondent pool was imported into SPSS Version 20.0. Responses which had been provided in the 'additional information' field were imported as unedited text.

Descriptive analysis of response distributions for each survey item was conducted to describe the characteristics of the sample and address the aim of the study. Frequency distributions of responses were generated and each item was analysed as an absolute frequency (n) and as a proportion of the total sample (%). To assess the effect of sampling bias due to non-responders, a limited number of attribute variables (gender, Accredited Practising Dietitian (APD) status, academic appointment level, highest level of qualification, journal article publication record) derived from publicly-available sources for the non-participant sample was compared with the participant sample. The chi-square goodness-of-fit test was used as to assess sample representativeness and the level of significance was set at  $P < 0.05$ .

#### **4.5. Results**

Eighteen Australian universities were identified as offering a total of 23 programs in nutrition and dietetics which either had, or were seeking, accreditation.

A total of 150 subjects initially identified via website searching and institutional verification as dietitians working in dietetics education programs in Australian universities, were invited to participate in the study. Responses were received from ninety-five participants, with at least one participant from each Australian university offering a dietetics program. Four invited participants were excluded from the study because they did not meet the inclusion criteria (n=3) or withdrew from the study (n=1). The final sample size of ninety-one complete survey responses represented a response rate of 62% of the total eligible sample frame (n=147).

As at March 2014, website data suggested there was a core academic dietetics educator workforce of approximately 150 (n=147) who were predominately female (90%). This was significantly different from a large national sample (n=8,391) of Australian academics where around half (51%) were females<sup>19</sup> but is similar to the gender distribution of the national dietetics workforce (93% female).<sup>3</sup> At this time, the website data indicated only eleven (7%) academic dietetics educators in Australia were Professors (Level E), which equated to less than one Professor per dietetics program (0.5). This distribution of Professor appointments is somewhat similar to that of academics nationally (11%), and the same when only female academics are compared for both groups (7% vs. 7%).

The website data also indicated that academic dietetics educators differed from the national academic sample in having a greater proportion at Lecturer level appointments (41% vs. 25%).<sup>19</sup> As of March 2014, 18 (12%) Academic dietetics educators appeared to have appointments outside of the typical classification levels (Other) including placement coordinators and project managers. The distribution of highest qualification level among the academic dietetics educator workforce indicated that over half (54%) had a PhD or other doctoral-level qualification. This is well below the level of doctoral qualification attainment identified in national academic workforce data (80%).<sup>19</sup> Males (n=14) were more likely to be qualified to the doctoral level (93%) than their female colleagues (50%) – a pattern which is reflected in national academic workforce data (85% PhD-qualified males vs. 75% PhD-qualified females).

Comparative analysis of study participants' attributes compared to that of the non-participants identified no significant differences in relation to gender ( $\chi^2 = 1.8$ ,  $P = 0.18$ ) and academic appointment levels ( $\chi^2 = 5.0$ ,  $P = 0.42$ ) (Table S4-2). However, there was a significant difference between the study participants and non-participants in terms of:

- APD status ( $\chi^2 = 10.1$ ,  $P = 0.02$ ), with a greater proportion of non-participants being an Advanced APD (13% vs. 10%);
- highest qualification ( $\chi^2 = 8.8$ ,  $P = 0.03$ ), with a greater proportion of non-participants having a doctoral degree (63% vs. 48%); and
- publication record ( $\chi^2 = 13.5$ ,  $P = 0.02$ ), with a greater proportion of non-participants having fifty or more journal publications in nutrition and/or dietetics research (23% vs. 12%).

The demographic, education and professional attributes of academic dietetics educators who participated in this study are presented in Table 4-1. There was no significant difference in gender distribution in this study sample (n=91; 92% female) compared to national dietetics workforce data from 2011 (n=3,705; 93% female) ( $\chi^2 = 0.9$ ,  $P = 0.33$ ).<sup>3</sup> However, this differed considerably from the gender distribution of the Australian academic workforce more generally (n=8,391; 51% female).<sup>19</sup> The age distribution in this study indicates more than two-thirds of the academic dietetics educators surveyed (68%) were under 50 years, with a quarter (26%) being fifty years or older. This age distribution appears younger than the age profile of academics nationally (59% are under fifty years of age; 42% are fifty years or over).<sup>19</sup>

Only one participant indicated they were not an APD (1%) whereas around 20% of dietitians in Australia are not APDs.<sup>11</sup> Over half of the sample (59%) reported their appointment fraction as being 1.0 full time equivalent (FTE) compared to 83% of academics nationally who are employed on a full-time basis.<sup>19</sup> Participant self-estimates of actual hours worked indicate that of the academic dietetics educators in this sample with a 1.0 FTE appointment fraction, more than two-thirds (69%) were working in excess of forty hours per week. This is significantly less than that reported among full-time Australian academics (n=6,893) who work forty hours or more per week (90%).<sup>19</sup>

**Table 4-1** Demographic, education and professional attributes of study participants

<i>Attribute</i>	<i>Number of participants (n)</i>	<i>Proportion of participants (%)</i>
Gender		
Female	84	92.3
Male	7	7.7
Age range		
20-29 years	8	8.8
30-39 years	30	33.0
40-49 years	24	26.4
50-59 years	19	20.9
60-69 years	5	5.5
No response	5	5.5
Current participant APD status		
APD	77	84.6
Advanced APD	9	9.9
FDAA	4	4.4
Not an APD	1	1.1
Academic appointment level with university <sup>(a)</sup>		
Level A (Associate Lecturer / Senior Teaching Fellow)	4	4.4
Level B (Lecturer / Assistant Professor B)	36	39.6
Level C (Senior Lecturer / Assistant Professor A)	20	22.0
Level D (Associate Professor)	11	12.1
Level E (Professor)	7	7.7
Other (e.g. Clinical Educator, Project Manager, Placement Coordinator)	13	14.3
Appointment fraction with university		
1.0 FTE	54	59.3
0.9 FTE	1	1.1
0.8 FTE	13	14.3
0.7 FTE	2	2.2
0.6 FTE	12	13.2
0.5 FTE	5	5.5
0.2 FTE	4	4.4
Number of hours worked for university per week		
1-8	2	2.2
9-16	3	3.3
17-24	10	11.0
25-32	8	8.8
33-40	27	29.7
41-48	21	23.1
≥49	20	22.0
Highest level of qualification (dietetics or other) <sup>(b)</sup>		
Level 7 – Bachelor degree	6	6.6
Level 8 – Bachelor degree (Hons), Graduate Certificate, Graduate Diploma	17	18.7
Level 9 – Masters degree	24	26.4
Level 10 – Doctoral degree	44	48.4
Highest level of qualification in dietetics		
Bachelor degree	7	7.7
Bachelor degree (Honours)	5	5.5
Diploma	2	2.2
Graduate Diploma	8	8.8
Masters Degree	20	22.0
Doctor of Philosophy (PhD)	42	46.2

**Table 4-1 (continued)**

Highest level of qualification in education		
Bachelor degree (Hons)	1	1.1
Certificate	4	4.4
Diploma	3	3.3
Graduate Certificate	30	33.0
Graduate Diploma	5	5.5
Masters degree	5	5.5
Doctor of Philosophy (PhD)	6	6.6
Postgraduate Diploma	2	2.2
No formal qualification in this area	35	38.5

- (a) Level E = Professor; Level D = Associate Professor; Level C = Senior Lecturer/Assistant Professor A; Level B = Lecturer/Assistant Professor B; Level A = Assistant or Associate Lecturer/Senior Teaching Fellow; O = other.
- (b) Qualification level as per Australian Qualifications Framework (AQF): 7 = Bachelor degree; 8 = Bachelor degree (Honours), graduate diploma or graduate certificate; 9 = Masters degree; 10 = Doctoral degree.
- APD, Accredited Practising Dietitian; FDAA, Fellow of the Dietitians Association of Australia; FTE, full time equivalent.

The most commonly reported (37%) academic workload distribution for this sample, of 40:40:20 (40% teaching: 40% research: 20% admin/service) was reflective of the typical Australian academic workload split.<sup>20</sup> Just over 4% of the sample indicated they held positions with a 100% research allocation while another 15% held positions with a 100% teaching allocation.

In this sample the majority (60%) of those surveyed reported having formal qualifications in education, with the most common level being a graduate certificate (33%). While close to 40% had no formal qualification in education, twelve (13%) respondents reported having commenced but not yet completed formal qualifications in education.

Table 4-2 presents the experience, practice and research attributes of study participants. The data demonstrates that the large majority of the sample (70%) had greater than five years practice experience outside of academia, with close to a quarter (24%) having greater than fifteen years of non-academic, dietetics practice experience. This contrasts with experience in academic practice reported by the sample with around half having five or less years of experience as a dietetics educator (48%) or as a dietetics researcher (50%).

Clinical dietetics was reported as the main area of specialisation in practice (51%), education (24%) and research (18%) in this sample. Academics with prior practice

specialisation in clinical dietetics who did not report clinical dietetics as their teaching focus, tended to nominate general nutrition (15%) or dietetics education (11%) as their area of teaching specialisation. Academics with a practice specialisation in public health nutrition (21%) tended to retain this focus for teaching (19%) and research (20%). Around a quarter (23%) of the sample had no journal article publications in nutrition and/or dietetics research with around half (48%) having never supervised a research higher degree student.

**Table 4-2** Experience, practice and research attributes of study participants

<i>Attribute</i>	<i>Number of participants (n)</i>	<i>Proportion of participants (%)</i>
Years since graduating as a dietitian		
<1 year	1	1.1
1-5 years	7	7.7
6-10 years	16	17.6
11-15 years	18	19.8
16-20 years	16	17.6
21-25 years	13	14.3
26-30 years	9	9.9
30+ years	11	12.1
Years of experience working as a dietitian in practice (outside dietetics education)		
<1 year	2	2.2
1-5 years	24	26.4
6-10 years	29	31.9
11-15 years	13	14.3
16-20 years	10	11.0
21-25 years	7	7.7
26-30 years	5	5.5
Have not performed this activity	1	1.1
Main area of specialisation as a practising dietitian (outside dietetics education)		
Clinical dietetics	46	50.5
Community and / or public health nutrition	19	20.9
Food service management	4	4.4
Nutrition and dietetics	5	5.5
Sports nutrition	3	3.3
Food industry	1	1.1
Private practice	6	6.6
Other	7	7.7
Years of experience working as a dietetics educator		
<1 year	5	5.5
1-5 years	37	40.7
6-10 years	19	20.9
11-15 years	19	20.9
16-20 years	3	3.3
21-25 years	4	4.4
26-30 years	2	2.2
Have not performed this activity	2	2.2



**Table 4-2 (continued)**

<b>Main area of specialisation as a dietetics educator</b>		
Clinical dietetics	22	24.2
Community and / or public health nutrition	17	18.7
Food service management	7	7.7
General nutrition / nutrition and dietetics	14	15.4
Dietetics education	10	11.0
Sports nutrition	2	2.2
Dietetics program placements	4	4.4
Other	13	14.3
Have not performed this activity	2	2.2
<b>Years of experience working as a dietetics researcher</b>		
<1 year	12	13.2
1-5 years	28	30.8
6-10 years	22	24.2
11-15 years	13	14.3
16-20 years	4	4.4
21-25 years	3	3.3
26-30 years	3	3.3
30+ years	1	1.1
Have not performed this activity	5	5.5
<b>Main area of specialisation as a dietetics researcher</b>		
Clinical dietetics	16	17.6
Community and / or public health nutrition	18	19.8
Food service management	2	2.2
General nutrition / nutrition and dietetics	20	22.0
Dietetics education	8	8.8
Sports nutrition	3	3.3
Private practice	1	1.1
Dietetics program placements	2	2.2
Other	14	15.4
Have not performed this activity	7	7.7
<b>Number of journal article publications in nutrition / dietetics research</b>		
1-9	32	35.2
10-19	13	14.3
20-29	4	4.4
30-39	7	7.7
40-49	2	2.2
50+	12	13.2
Have not performed this activity	21	23.1
<b>Number of HDR (Masters Research, PhD) students participant has supervised to completion</b>		
1-5	33	36.3
6-10	3	3.3
11-15	3	3.3
16-20	1	1.1
21-25	1	1.1
Have not performed this activity	50	54.9
<b>Number of HDR (Masters Research, PhD) students participant is currently supervising</b>		
1-5	35	38.5
6-10	10	11.0
11-15	1	1.1
Have not performed this activity	44	48.4

HDR, Higher Degree Research

## 4.6. Discussion

This study attempted to describe the core academic dietetics educator workforce in Australia but sampling constraints meant that there was greater representation from a less experienced and credentialed cohort, that may be described as ‘emerging.’

Given the significant lack of published data on the dietetics workforce in Australia, the total sample of 147 eligible subjects derived from websites represented a limited estimate of the size of the core academic dietetics educator workforce in Australia as at 2014. Bearing in mind the limitations of deriving and verifying data from websites, Australian academic dietetics educators appeared to be a predominantly female, relatively small workforce group (~2% of the Australian dietetics workforce) who were widely distributed across eighteen universities.

Despite observation of expedited academic elevation of dietitians in universities,<sup>11</sup> the academic dietetics educator surveyed were more likely to be at lower academic levels and fewer had doctoral qualifications compared to other academics in Australia. This reflects the sample itself, but it may also indicate the relative early-stage development of the academic dietetics educator workforce compared to academia more generally. The data appears to indicate a small workforce pool of academic dietetics educators at Professor level which reflects the DAA’s view that there is a low supply of experienced, higher-level academics.<sup>3</sup> While Professors appear unequally distributed across universities (six out of eighteen university websites did not indicate an Professor as of March 2014) the total number is proportionately consistent with the broader academic workforce.<sup>19</sup>

The generalisability of descriptive data relating to workforce attributes in this study is limited by sample bias associated with non-participants. Despite multiple attempts to engage all academic dietetics educators in this study, the non-participation and under-representation of educators with Advanced APD status, with PhDs and with an established research publication

record limits the generalisability of this study's findings to represent the emerging academic dietetics educator workforce rather than giving the full picture. Further, the comparison of the sample of the workforce to the broader academic workforce (which includes disparate disciplines such as law and business) is limited by the scarcity of available data profiling the attributes of other health professional academics.

It is acknowledged that other dietitians employed by universities on a sessional or 'as required' basis, such as guest lecturers with specialist knowledge and dietetics-qualified PhD students, make important contributions to the preparation of the future dietetics workforce. However, quantifying and describing the contributions of the casual academic workforce has been described as poorly understood and notoriously challenging.<sup>21</sup> It is also recognised that there is a pool of dietitians who make significant contributions to the education and professional development of the future dietetics workforce in university-coordinated, dietetics placement settings. This study, however, aimed to profile the core academic dietetics educator workforce and the inclusion of 'sessional' and placement-based staff was outside the scope of this study.

This sample of the academic dietetics educator workforce appears to be older in age than comparison populations such as the national dietetics workforce<sup>3</sup> and the private practice dietetics workforce,<sup>10</sup> but appears younger than the broader Australian academic workforce.<sup>19</sup> The differences seen within the profession are not surprising given that careers in academia are usually preceded by professional practice and/or research training (often as pre-requisites for university employment) and the scarcity of recent graduate/early career positions typically available in academia. The finding that this sample of the academic dietetics educator workforce had a relatively young age profile is consistent with previous national comparisons of dietetics with other professions.<sup>3</sup>

Compared to other dietetics workforce populations,<sup>3,10</sup> academic dietetics educators generally have higher levels of formal qualification, reflecting credentials required in academic roles. Higher education providers in Australia are required to ensure that staff who teach students are appropriately qualified to at least one Australian Qualification Framework (AQF) level higher than the course of study being taught.<sup>22</sup> With most educators required to attribute some proportion of their work activities to research, it is not surprising that the academic dietetics educator workforce either has or is expected to pursue higher qualifications (e.g. PhD). With just over half of this study sample still to achieve PhD-level qualifications and considering the aforementioned AQF regulations, any lag in achieving the required credentials for academic careers is likely to be short term. Such trends have been observed in nursing where the proportion of nurse academics with doctorate-level qualifications trebled between 1994 and 1999 in response to industry standards and expectations within a profession that was relatively new to academia.<sup>23</sup>

Broadly speaking, the respondents to this workforce survey were relatively inexperienced in dietetics education and research (around half had five or less years' experience in either). This may reflect rapid growth in this sector over the last decade and the limited capacity of the dietetics workforce to supply suitably qualified and experienced academic dietetics educators. Despite claims that the quality of some university dietetics programs has been diluted due to the limited supply of appropriately-qualified and experienced academic dietitians,<sup>11</sup> this expansion has likely provided pathways for dietitians into academic careers who may not have otherwise had the opportunity to work in this sector. It has also likely contributed to a parallel research up skilling of the dietetics workforce, with many academic dietetics educators undertaking or completing research higher degrees as a condition of their employment in a university. It is logical to assume that a greater number of experienced and credentialed dietetics educators will emerge over time as academic dietetics educators develop

more established research, practice and teaching track records that are commensurate with such positions, and as required by higher education institutions and national statutory authorities.

The finding that the majority of academic dietetics educators with a 1.0 FTE appointment fraction are working significantly more than the 38 hours required in a standard work week,<sup>24</sup> is consistent with overtime work practices of other Australian academics.<sup>19</sup> Over half (52%) of Australian academics report having a preference to work fewer hours than what they currently do, with two-thirds (65%) preferring to spend less time on administration and service activities.<sup>19</sup> Further research is needed to explore if these preferences are shared by academic dietetics educators and to better understand the factors that influence their weekly hours worked.

While non-traditional domains of dietetics practice have been expanding in Australia (e.g. private practice) relative to the traditional domains (e.g. public hospitals),<sup>25</sup> it would appear a large proportion of academic dietetics educators have followed pathways to academia through traditional routes – predominately clinical dietetics. As the dietetics workforce continues to branch into new areas of practice, ensuring that the academic dietetics educator workforce has a diverse profile of practice experience and scholarship across different dietetics domains will be an important workforce development strategy.

This is the first study to exclusively investigate the size and professional attributes of the dietetics educator workforce in Australia. Despite the limitations of the survey sample, it highlights the developmental status of this workforce group, relative to the broader academic workforce in Australia and provides a foundation for future analyses of the academic dietetics educator workforce. As a small but influential sector of the national dietetics workforce, academic dietetics educators are likely to require continuing support to fulfil their potential at the forefront of dietetics education and research. Ongoing data collection and research on this

important workforce group is required to further enhance dietetics workforce preparation in Australia.

#### **4.7. Disclosures**

The authors are associated with Bond University which contributes to the academic dietetics educator workforce.

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## **Chapter 5. Exploration of Academic Dietetics Educators' Experiences**

## 5.1. Preface

This chapter explored academic dietetics educators' experiences of, and challenges faced in, dietetics workforce preparation and preparedness in Australia. As key stakeholders in educating, training and preparing dietetics graduates for the workforce, academic dietetics educators play integral roles in shaping the future profession and are well-placed to provide insights into the phenomena of interest.

A review of the literature indicated that while the experiences of other key stakeholders, including dietetics practice educators and dietetics students, have been explored to some extent, evidence regarding the perspectives of this important workforce group was lacking. In particular, a national approach to exploring academic dietetics educators' experiences in Australia had not been taken. In-depth, semi-structured interviews with academic dietetics educators from across Australia were therefore necessary.

Data collected in this study was also used to guide the subsequent qualitative study regarding dietetics practice educators' experiences of workforce preparation and preparedness (Chapter 6).

This chapter contains the accepted version of an original manuscript published in a peer-reviewed journal. The formatting of this manuscript is consistent with the thesis style. References for this manuscript appear at the end of the chapter and supplementary tables and figures appear in the appendices at the end of the thesis.

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## **5.2. Abstract**

### **5.2.1. Aim**

Dietetics educators represent a small but influential workforce group that has experienced significant change in recent years. The workforce development challenges faced by this group have been largely unexplored. The present study aimed to explore the experiences of, and challenges faced by, academic dietetics educators in preparing dietitians for the workforce.

### **5.2.2. Methods**

The approach taken in the present study was informed by qualitative description. Fifteen dietetics educators employed by 13 universities across Australia were purposively sampled. In-depth, semi-structured interviews conducted via telephone (n = 12) or face-to-face (n = 3) were digitally recorded then transcribed verbatim. Data were managed with NVivo and inductively analysed using open coding. Codes were condensed into themes through an iterative process involving multiple researchers.

### **5.2.3. Results**

The overarching theme of ‘aiming for a moving target’ was underpinned by the themes of: (i) striving for betterment; (ii) bridging dissonance and (iii) distressing impossibilities.

Interviewees described how they were driven to enhance the preparation of dietitians but acknowledged disparity between what graduates are being prepared for and what they need to be prepared for. Heightened expectations of others, professional constraints and a lack of collegiality among the profession were among the challenges that manifested in a sense of frustration, concern and isolation.

#### **5.2.4. Conclusions**

Dietetics educators are motivated to shape and enhance the future profession. However, they face numerous challenges in their efforts to prepare graduates who are well-equipped for increasingly diverse dietetics practice. Strong leadership, academic collaboration and greater engagement of the broader workforce are required for the benefit of the entire profession.

#### **5.2.5. Keywords**

Dietetics educators, education, qualitative research, students, university, workforce

### **5.3. Introduction**

Health professional educators in higher education settings are operating in increasingly challenging and changing environments. Health systems for which educators are preparing graduates are under tremendous pressure to perform.<sup>1,2</sup> Health workforce preparation is further pressurised by the expectations and demands of the higher education sector.<sup>3</sup> The urgent need to support the health workforce into the future by transforming how the health and education systems work together has been recognised in Australia,<sup>2</sup> with similar calls for reform emerging from the USA<sup>4</sup> and the UK.<sup>5</sup> As contributors to the broader health workforce and more specifically the dietetics workforce, dietetics educators are likely to experience these challenges.

An academic dietetics educator (herein referred to as dietetics educators) has been defined as a dietitian employed by a university to educate and prepare entry-level dietitians for the workforce predominately within the university setting.<sup>6</sup> Dietetics educators are well-positioned to have a considerable influence on the professional development of dietetics students/graduates and therefore, to shape the future dietetics workforce. They, along with

other key stakeholders, can lay the foundation for a dietetics graduate's independent practice as a dietitian, and are critical to providing quality learning experiences for students.<sup>7-9</sup>

Conducting research is a requirement for most dietetics educators in academic roles.<sup>6</sup> However, research regarding dietetics educators themselves appears to be lacking. Internationally, it is suggested that academia and research is one of the greatest growth areas in which dietitians work,<sup>10</sup> yet it remains a relatively small workforce sector. In 2014, the core workforce of dietetics educators in Australia was estimated to comprise just 2% (n=147) of a dietetics workforce that was growing at around 10% annually.<sup>6</sup> The proportion of dietitians working as dietetics educators in other countries with an established dietetics workforce is yet to be published. However, with 7% or less of dietitians in the USA and Canada reporting education and research as their practice area,<sup>11,12</sup> it is likely to be similarly small. While establishing a profile of the dietetics educator workforce is useful to inform workforce planning and development, it is the experiences of these stakeholders that present a source of intelligence which could help inform the preparation of future dietetics workforces.

Exploring dietetics workforce preparation from the perspectives of other stakeholders including dietetics practice educators (preceptors/placement supervisors),<sup>13,14</sup> students,<sup>15,16</sup> graduates<sup>17,18</sup> and employers of graduates<sup>19,20</sup> has, to some extent, been investigated. Existing research has generally taken a piecemeal approach and focused on specific elements of workforce preparation (e.g. assessment) with participants being mostly from a single location (i.e. one university).<sup>14-16,21-24</sup> In the absence of empirical evidence exploring the perspectives of dietetics educators, it has been speculated that their challenges may include: sourcing suitable student placements; equipping graduates to practice internationally; having valid and consistent assessment tools;<sup>25</sup> a more diverse and demanding student population;<sup>26</sup> and teaching using relevant technology.<sup>27</sup>

Recent research commissioned by national dietetics bodies in the USA,<sup>26,28,29</sup> the UK<sup>30</sup> and Canada<sup>12,31</sup> has attempted to inform dietetics workforce development and hypothesize on the future direction of the profession. However, to the authors' knowledge, no national approaches to date have broadly explored dietetics workforce preparation and the impact of associated challenges from the perspective of dietetics educators. As key stakeholders in preparing future dietetics professionals, dietetics educators can provide valuable insights into workforce preparation. Understanding the experiences and challenges faced by dietetics educators may be critical to informing strategic and effective workforce planning and development into the future. This study aimed to explore the experiences of, and challenges faced by, academic dietetics educators in preparing dietitians for the workforce.

## **5.4. Methods**

The approach taken in this study was informed by qualitative description whereby researchers sought to describe dietetics educators' perspectives on their experience of preparing dietitians for the workforce.<sup>32</sup> The researchers adopted a social constructionist epistemological position (that realities are socially constructed by the research participants and their interactions with the world) and an interpretivist theoretical perspective (that those realities come from how the research participants interpret and make sense of their experiences).<sup>33-35</sup> Inclusion criteria required participants to be dietitians employed, either part-time or full-time, by an Australian university offering a dietetics program. They also needed to contribute to the education and/or preparation of dietitians for the workforce. Participants were purposively sampled due to their experience of the phenomenon being investigated and their potential to provide substantial insights.<sup>36</sup> Individuals identified as dietetics educators from a previous study (n=91)<sup>(6)</sup> were stratified based on professional attributes and demographics including: i) years of experience in dietetics education; ii) area of specialisation as a dietetics educator; and iii) geographical

locations across Australia. To capture a diverse range of perspectives, maximum variation sampling<sup>35,37</sup> combined with random selection was employed across each of the stratified sub-samples.

The Bond University Human Research Ethics Committee provided ethical approval for this study. Recruitment commenced February 2015 and ceased July 2015. Dietetics educators were invited to participate by the primary researcher (KM) via email and were followed up with a telephone call. An explanatory statement with details of the study, including assurance of confidentiality, informed consent and example question topics, was emailed to potential participants. Reminder emails were sent at approximately two weeks and four weeks after the initial invitation to those who had not responded. Respondents were asked to indicate a suitable interview time and were provided with the interview guide.

Interviews were the chosen enquiry method and the interview guide included 10 open-ended questions designed to elicit in-depth participant responses about their experiences of and challenges faced in the phenomenon of interest (Table 5-1). Interview questions were guided by the study's aim and informed by a review of published literature which revealed a paucity of evidence related to dietetics educators' experiences. Further, questions were shaped by the researchers' experiences in health workforce preparation and their awareness of extant challenges in the higher education sector. Demographic and professional attributes were also requested from each participant. Prior to recruitment, interviews were piloted with two dietetics educators who were not part of the research team, with minor modifications made to the interview guide (e.g. re-ordering of questions to enhance conversational style) based on researcher and pilot feedback.



**Table 5-1** Questions used to guide in-depth, semi-structured interviews with dietetics educators

Question	Enquiry logic
1. Can you describe your own experience of being prepared as a dietitian for the workforce?	Own experience of workforce preparation
2. How prepared did you feel as a dietitian entering the workforce?	Own experience of preparedness
3. How did you come to be working in dietetics workforce preparation?	Pathway into and motivations for work
4. Can you describe your experience of preparing dietitians for the workforce?	Experience of workforce preparation
5. Do you have a philosophy or approach that guides your work in preparing dietitians for the workforce, and if so, can you describe it?	Pedagogical approach and influences on workforce preparation
6. Can you describe the learning and teaching methods you use to prepare dietitians for the workforce?	Pedagogical practices and influences on workforce preparation
7. What challenges do you face in your work to prepare dietitians for the workforce?	Own challenges faced in workforce preparation
8. What challenges are faced by the dietetics educator workforce in preparing dietitians for the workforce?	Views on challenges faced by others in workforce preparation
9. How prepared for the workforce do you believe graduate dietitians are today?	Views on preparedness of current graduates
10. What are the challenges faced by dietitians entering the workforce today?	Views on challenges faced by graduates

The research team's experience in, and familiarity with, either dietetics education and related research (KM, KC & DR) or medical education and related research (SS & LC), informed their position that educators were important informants on the phenomenon of interest and that they would likely experience challenges in dietetics workforce preparation. As all authors were experienced health professional educators familiar with the challenges faced across a range of disciplines, this influenced the focus of the research. The primary researcher – a female dietetics educator with qualitative research experience – conducted the interviews. Interviews were conducted either face-to-face or via telephone (depending on participant preference and proximity to the primary researcher) at a suitable time for participants and were digitally recorded with the participants' written informed consent. Interview recordings were transcribed verbatim by the primary researcher and field notes were kept for subsequent reflection and data validation. To describe the sample, participant demographic and professional attribute data were collated and frequency distributions generated using SPSS (Version 20, Armonk, NY: IBM Corp.).

Each transcript was read multiple times by the primary researcher to develop familiarity with the data and to generate initial notes. Transcripts were imported into NVivo, version 10 software<sup>38</sup> and systematically analysed using open coding.<sup>39</sup> Each piece of data was assigned an initial note, with initial notes then being grouped into initial codes to enable subsequent organisation of preliminary themes.<sup>39,40</sup> Codes were handwritten and visually mapped to illustrate the developing themes and sub-themes. This was an iterative process whereby codes and themes were revisited multiple times by multiple researchers (KM, DR & SS) to develop final themes (Figure S5-1). Inductive analysis continued until theoretical sufficiency was reached, whereby researchers were satisfied that the study's aim had been sufficiently addressed.<sup>41</sup> Once themes were agreed, an overarching theme was developed by the researchers to capture the essence of the main themes and the collective meaning of the dataset. Two

researchers (DR & SS) reviewed a sample of interview transcripts and codes to ensure: that the data was examined from multiple perspectives; that data was comprehensively translated by the primary researcher; and that the synthesised themes reflected participant perspectives.<sup>41</sup> Reflective memos were kept to acknowledge subjectivity and interpretive analysis.<sup>42</sup>

## **5.5. Results**

Twenty-one dietetics educators were invited to participate, with 15 providing written informed consent. Two did not respond to the invitation, two declined to participate (citing a lack of time) and another two responded but were not required due to theoretical sufficiency being reached. Dietetics educators from 13 universities from across the six Australian states/territories where dietetics education programs were offered were interviewed. Most interviews were conducted via telephone (n=12) with three being conducted face-to-face due to the preference and proximity of the participant. Interviews lasted an average of 64 minutes (range: 38 - 100 minutes). Participants represented a range of experience levels in dietetics education with the majority (53%; n=8/15) having greater than ten years of experience. Most participants were female (87%; n=13/15), aged between 40-49 years (47%; n=7/15) who reported Individual Case Management (ICM) or Community and/or Public Health Nutrition (both 27%; n=4/15) as their main area of specialisation as a dietetics educator (Table S5-1).

A total of 197 initial codes assigned to the data were grouped into nine provisional themes and 30 sub-themes. These were revised and condensed until one final overarching theme, three main themes and nine sub-themes relating to the challenges faced by dietetics educators were identified from the data (Figure 5-1). The overarching theme of 'aiming for a moving target' was underpinned by the main themes of: (i) striving for betterment; (ii) bridging dissonance; and (iii) distressing impossibilities. The themes presented below are supported by verbatim quotes with participant identification codes used to maintain anonymity.



**Figure 5-1** Thematic map showing overarching theme (orange triangle), themes (blue circles) and sub-themes (green ovals) relating to challenges faced by dietetics educators

*Overarching theme – Aiming for a moving target:* The overarching theme reflected dietetics educators' attempts to aim for a moving target. Despite participants' inner drive to deliver a well-equipped workforce, they were challenged to reach elusive goals while being constrained by external forces. Dietetics educators were motivated by their perceived contribution in shaping the future workforce yet described frustration in their work to deliver relevant graduates. The experience of preparing dietitians for the workforce was summarised by one participant as being battered by a storm.

*'(We're) in the eye of the perfect storm. We're being pushed from below by the university...we've got our stakeholders, the employers, all the stuff that's happening in the health care sector, that drives things around placement...and then you've got accreditation...there are a lot of pushes and pulls' (DE030)*

Participants felt that incoming pressures from multiple sources hindered their efforts in dietetics workforce preparation. The following three themes and nine subthemes further illustrate the challenges experienced by dietetics educators.

*Theme 1 – Striving for betterment:* Within this theme, dietetics educators expressed a sense of altruism and their motivation to 'make things better'. They used their experiences as past students and supervisors as a point of comparison and described how they wanted students to be better prepared for practice than they felt they had been. This striving for betterment in student preparation was seen as a mechanism by which the profession may be enhanced.

*Subtheme - Transforming education:* Participants reflected that their own experiences as students were not optimal and that they were driven to transform dietetics education into a positive experience for students today. Some participants had unpleasant and uninspiring encounters with their own educators when they were students (both practice- and university-based) which had a lasting impact on them.

*'I had such a terrible dietetic education experience, I thought 'surely I can do better than that.' That experience greatly influenced my work in preparing dietitians for the workforce today...going in the opposite direction of what I got exposed to.'* (DE055)

*Subtheme - Enhancing the profession:* Many participants saw themselves as being in a position where they could, and wanted to, enhance the emerging workforce. One dietetics educator viewed themselves as a guardian of students, helping to maintain and further inspire student's interest in nutrition. The honour of helping to shape future practitioners and the profession, was shared by another participant when they expressed:

*'to be involved in education and to have a role in influencing the future profession, I see as a real privilege and something that I take really seriously.'* (DE117)

*Subtheme - Cultivating practitioners:* It was widely reported by participants that their drive to make things better was perpetuated by seeing students develop. When dietetics educators observed professional growth in students and when they received positive feedback from others (e.g. graduates, supervisors), it reinforced their motivation to keep preparing future dietitians as best they can.

*'when you see students really get something and are passionate about it and (they) go on working in the area, that sort of thing is inspiring and it keeps you passionate.'*  
(DE079)

Participants were motivated by the long-lasting impact that their educational experience had on them and by witnessing their own students develop from novices into professionals. Their desire to help others and contribute to the 'greater good' shaped the experience they were trying to provide for their students.

*Theme 2 – Bridging dissonance:* In this theme, dietetics educators looked to the 'real world' to affirm their view that disparities existed between graduates' preparation needs and graduates' preparation experiences. Participants described their continual efforts to bridge that

gap by providing students with meaningful preparatory experiences to help them to secure work upon graduation. The dietetics educators expressed their concern at how this incongruity could impact graduates and the profession.

*Subtheme - Practice diversity:* Reflection on the past and how ‘times had changed’ was again apparent in this subtheme. Participants recognised that the areas in which dietitians now practised were very diverse, compared to many years ago when there were fewer practice domains. They also recognised that not all areas of practice were, or could be, taught during a university program due to constraints and already full curricula.

*‘the other thing that has changed is just the diversity of roles for dietitians...when I first started out it was really all about preparing people to be clinical dietitians.’ (DE030)*

*Subtheme - Accreditation constraints:* While the majority of dietetics educators believed that graduates were ‘as well prepared as possible’ for the workforce, this was mostly in regard to the traditional domains of practice (e.g. clinical dietetics). Participants described how professional accreditation requirements had resulted in programs that were not able to dynamically respond to changing workforce needs, and in graduates that were not well-equipped to pursue work in non-traditional or emerging areas of practice.

*‘We have a dietetics course that’s focused around three different domains (of practice) but many of our graduates are going into private (freelance) practice, they’re not as prepared under the traditional training model’ (DE103)*

*Subtheme - Graduate oversupply:* The struggle of dietetics educators to bridge the preparation-practice divide was further exacerbated by the increasing number of graduates being produced from university programs. While some participants thought there had always been competition for dietetics jobs, it was a commonly shared view that the supply of dietetics graduates far outweighed the apparent demand. One participant expressed their concern for how this posed a risk to the broader profession.

*'The ability to walk into your perfect job within a few weeks of graduating now (is) not particularly realistic, and I think that that does pose a big challenge, because word gets out, students decide that 'I'm not going to do dietetics, I'm going to do something else', we'll lose the brightest leaders of the future.'* (DE085)

Attempting to bridge the gap between dietetics preparation and practice was a source of frustration for the participants in this study. Curricula that were bound by program accreditation requirements were seen to have contributed to an apparent surplus of traditionally-prepared dietetics graduates that outweighed the existing demand.

*Theme 3 – Distressing impossibilities:* The multiple expectations that dietetics educators felt were placed on them created a sense of impossibility, which manifested into frustration at others and the dietetics educators themselves being affected personally. Within this theme, participants were increasingly required to 'do more with less.' Participants recognised that this issue was broader than just dietetics and was due, in part, to increased pressure on governments, health care institutions and universities to be more efficient. The lack of apparent support to help address these challenges left many educators feeling isolated in their efforts to shape the future workforce.

*Subtheme - Unachievable expectations:* Some participants felt that practice educators had heightened expectations for students to arrive at placements better prepared than what students had been previously. This was due, in part, to practice educators having to take more students on placements while already struggling with heavy workloads. Students' increasingly high expectations that they should receive a quality educational experience was an additional source of pressure on dietetics educators. For example, one participant highlighted students' expectations to be taught with the most current technology:

*'Technology related to learning and teaching, every year there's a new platform and if you don't learn it and keep up with it you're behind everybody else, so students look at*



*you and think 'well this is a bit of an average subject because they're not using all these new interface things that I enjoy seeing in other subjects.'* (DE103)

Organisational constraints and efficiency drives of higher education institutions were also seen as unrealistic and unreachable, adding to the sense of impossibility. University policies, such as those in relation to teaching and assessment, were not seen as conducive to providing quality student experiences.

*'You know the marking, the marking is just diabolical. At our uni we're meant to be spending half an hour per student per semester which is just ridiculous, you just can't do that.'* (DE200)

*Subtheme - Frustration at others:* The sense of impossibility appeared to result in frustration at others, specifically other stakeholders and organisations. Animosity towards the professional association for its ambiguity and inflexibility around program accreditation was expressed by a number of participants. Some also lamented the lack of involvement from the wider dietetics profession, whom participants thought should help share the load of preparing the workforce of the future. Frustration was also directed towards the dietetics educator workforce itself for its lack of collegiality and collaboration. As one participant reflected:

*'I mean, people have friends they can call up but I don't really think that it's a nice support network, and I think part of the problem is that (dietetics educators) do view (sharing knowledge and resources) as competition or a conflict of interest rather than genuinely helping people and working to improve the profession.'* (DE077)

*Subtheme - Being personally affected:* The impact of trying to reach apparently unattainable outcomes was internalised by some participants who felt personally affected. While some dietetics educators acknowledged that academia had always been demanding, others felt that they were constantly having to work outside standard hours and were juggling increasing workloads with less support. This was reflected by some participants who reported

feeling exhausted, tired and isolated. A personal concern shared by several participants was in relation to students – either not getting work upon graduation or by performing poorly on placement.

*‘I’m very worried, I worry about the student, I worry about the supervisor and our relationships with the sites and the patients and the community and you just feel very responsible without a lot of support behind you.’ (DE049)*

Conversely, some participants viewed such challenges with a more pragmatic approach and did not internalise them as a personal responsibility. One dietetics educator saw their perceived challenges as surmountable and ‘part of the job.’

*‘I think I overcome them (challenges) all. You could say the constraints of university administrative systems (are a challenge), but I don’t see it as a challenge, I just see it as part of my job.’ (DE116)*

Meeting the expectations of others including students, universities and other healthcare stakeholders was seen by some participants as an unattainable feat. The sense of impossibility resulted in feelings of frustration, concern and isolation, due in part, to a lack of support and a lack of collegiality within both dietetics education and the wider profession.

## **5.6. Discussion**

This study describes the challenges faced by academic dietetics educators in dietetics workforce preparation – an experience illustrated by the overarching theme of ‘aiming for a moving target.’ The three themes (striving for betterment; bridging dissonance; and distressing impossibilities) and nine subthemes that were constructed from the data suggest that dietetics educators face numerous challenges in their efforts to prepare graduates who are well-equipped to meet increasingly diverse areas of dietetics practice. Despite heightened expectations of others, professional constraints and a perceived lack of collegiality among the profession,

dietetics educators remain driven to enhance the preparation and preparedness of dietetics graduates.

Dietetics educators in this study were altruistic in their desire to make things better – both the educational experience of their students and the future profession. Their acknowledgement of being in a position to influence and shape the profession echoes the perspective previously shared by dietetics students<sup>9,43,44</sup> and students in other health professions.<sup>45,46</sup> Understanding dietetics educators' drivers could be used to enhance their performance and productivity in workforce preparation and subsequently, that of the future workforce. Harnessing the collective motivation of dietetics educators nationally, could facilitate collaborative problem-solving, sharing of innovations and championing of common causes. The success of a recent community of practice for dietetics educators in Australia<sup>47</sup> (established after these interviews took place) may provide a blueprint and impetus for all stakeholders in dietetics education to work together to address shared issues.

The findings of this study highlight the need for curricula reform if dietetics graduates are to be relevant in an increasingly diverse and dynamic practice environment. Rigid program accreditation requirements were seen to have exacerbated the perceived issue of an oversupply of dietetics graduates who were under-equipped for embracing contemporary opportunities. This was anticipated by a 2012 dietetics workforce demand study which warned that without adaptability, there would be too few dietitians equipped for emerging areas and too many for declining areas.<sup>26</sup> Despite pleas to prepare dietetics professionals who can respond to the rapidly changing practice environment<sup>48-50</sup> and calls for greater flexibility in dietetics education programs,<sup>25,51</sup> it is not surprising that dietetics educators recognise a chasm between workforce preparation and practice. This study adds to recent calls by other educators to provide students with more diverse experiences across non-traditional dietetics domains.<sup>52</sup> Placing students in non-traditional settings,<sup>53</sup> in underserviced areas<sup>54</sup> and on role-emerging placements<sup>55</sup> have

demonstrated benefits for key stakeholders and may help to pioneer new professional pathways.

The perception of dietetics educators in this study that incongruity exists between the supply and demand of dietetics graduates echoes the views of dietetics employers, practitioners and the professional association.<sup>56</sup> Incongruities have also been witnessed in other countries with workforce shortages in Canada<sup>12,31</sup> and internship shortages in the USA.<sup>57,58</sup> These issues could be due in part to the significant changes seen within the dietetics profession and dietetics education in recent years.<sup>10</sup> Further, the lack of available data on workforce trends in Australia,<sup>56</sup> limits dietetics educators' efforts to produce a workforce that can anticipate and meet market demands. National approaches to analysing how dietetics practice areas are changing and proposing how the future workforce may look have been conducted in the USA<sup>11</sup> and the UK,<sup>30</sup> respectively. If workforce preparation is to be matched to future practice needs, similar strategies which are led by the professional association in conjunction with the dietetics profession are urgently required in Australia. Moreover, a broad, comprehensive review of existing dietetics workforce preparation scholarship in Australia would help to identify evidence gaps and to guide dietetics educators in conducting future research.

Meeting heightened expectations while managing a demanding workload, as expressed by participants here, confirms suggestions made in earlier literature<sup>26,27</sup> and is a challenge shared by dietetics practice educators.<sup>13</sup> Dietetics educators' view that they need to 'do more with less' will likely continue given that they are operating in a field that straddles both the health and higher education sectors. This may be further amplified by the non-collegial culture described by the dietetics educators in this study. There is a need for broad engagement across the entire profession to share the responsibility of cultivating future dietitians. Professional associations must incentivise and facilitate engagement of more practitioners in dietetics workforce preparation while leaders in dietetics education need to

advocate for and illustrate examples of how this can be achieved. Bringing together groups of dietitians with shared concerns and interests, such as through communities of practice,<sup>59,60</sup> may be effective in enhancing collegiality among the workforce.

The views expressed by the dietetics educators in this study are consistent with the three innate needs that influence motivation as described in self-determination theory<sup>61</sup> which has previously been used as a framework to understand learning and teaching processes in medical education.<sup>62</sup> The need for autonomy (a desire to feel in control of one's own destiny) is reflected in how the educators felt constrained by rigid accreditation standards. The educators' perceptions that they were in a position to influence future dietitians and the existence of a non-collegial professional culture signals their need for relatedness (a desire to feel accepted, valued and connected to others). The perceived need of educators to meet heightened expectations and 'do more with less' aligns with their need for competence (a desire to feel effective by seeking out challenges that can enhance skills). This theoretical framework could be used in future studies to further explore the motivations of dietetics educators and other stakeholders involved in dietetics education.

Future research that explores the perspectives of other key stakeholders in dietetics workforce preparation, including dietetics practice educators and dietetics graduates, would be valuable. These perspectives may either corroborate or challenge the views expressed by the educators in this study and could further inform dietetics workforce development by contributing additional insights into the challenges that need to be addressed. Further, exploring potential solutions to the challenges faced by these key stakeholders could be a useful catalyst to enhance efforts towards dietetics workforce preparation quality improvement. The exploration of challenges experienced by dietetics educators in other countries is also needed to advance dietetics education, and workforces, internationally.

This is the first study to take a national approach to broadly explore the experiences of academic dietetics educators in Australia and has revealed challenges faced within this important workforce group. Throughout the study, steps were taken to ensure rigour was demonstrated. The primary researcher conducted all interviews to ensure consistency and reliability while verbatim transcripts enhanced confirmability.<sup>42</sup> Reflexivity was employed during data collection and analysis to acknowledge the researchers' positions and their potential impact on the findings.<sup>33,63</sup> The involvement of multiple researchers in coding and analysis was used to enhance dependability, credibility<sup>42</sup> and interpretive validity.<sup>32</sup> Further, the reporting of this research was guided by the relevancy, appropriateness, transparency and soundness (RATS) qualitative research review guidelines<sup>64</sup> as shown in Table S5-2.

The small sample size of this study is consistent with qualitative research aimed at obtaining in-depth insights of the phenomenon being investigated from well-placed informants. Transferability of this study's findings was enhanced by purposively selecting a diverse sample of participants from across Australia. The challenges faced by the educators in this study may or may not be experienced by other dietetics educators. Non-respondents were not followed up. However, given that two respondents declined the invitation due to a lack of time, it is plausible that this may have prevented their participation. A potential limitation of this study was that participants may have been affected by social acceptance or desirability bias due to the interviewer being a dietetics educator.<sup>65</sup> Care was taken to ensure that questions were open-ended and not leading in order to minimise researcher influence on participants. It is not known if or how revised competency and accreditation standards for dietetics programs in Australia implemented since this study took place<sup>66,67</sup> will impact dietetics educators' perceptions. However, ongoing engagement with and exploration of dietetics educators' experiences regarding the phenomenon of interest is warranted.

This study has provided an opportunity for one group of influential stakeholders in dietetics education to share substantial insights into the phenomenon of dietetics workforce preparation. Dietetics educators believe they have the capacity and drive to shape the dietetics profession – a profession which is ideally-placed to help address the growing burden of nutrition-related health conditions. This study reveals that dietetics educators are motivated to optimise how dietitians of the future are prepared, and are attempting to match preparation efforts with practice but are impacted by and faced with numerous challenges. For dietetics workforce preparation to be optimised, strong leadership, academic collaboration, meaningful scholarship and greater engagement is required for the benefit of the entire profession.

## **5.7. Disclosures**

The authors KM, DR and KC are associated with university dietetics programs which contribute to the academic dietetics educator workforce in Australia.

## **5.8. Acknowledgements**

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## **Chapter 6.      Exploration of Dietetics Practice Educators’ Experiences**

## 6.1. Preface

This chapter explored dietetics practice educators' experiences of, and challenges faced in, dietetics workforce preparation and preparedness in Australia. As key stakeholders in preparing dietetics graduates for the workforce, dietetics practice educators play integral roles in shaping the future profession and are well-placed to provide insights into the phenomena of interest.

A review of the literature indicated that while the experiences of dietetics practice educators have been explored to some extent, their perspectives were often sought on individual aspects of dietetics education programs and placements (e.g. student assessment activities). In particular, a national approach to exploring dietetics practice educators' experiences in Australia had not been taken. In-depth, semi-structured interviews with dietetics practice educators from across Australia were therefore necessary.

Data collected in this study was also used to guide the subsequent qualitative study regarding dietetics graduates' experiences of workforce preparation and preparedness (Chapter 7).

This chapter contains the accepted version of an original manuscript to be published in a peer-reviewed journal. The formatting of this manuscript is consistent with the thesis style (e.g. spelling of the word program has been amended to reflect Australian English). References for this manuscript appear at the end of the chapter and supplementary tables and figures appear in the appendices at the end of the thesis.

Citation: **Morgan, K**, Campbell, KL, Sargeant, S, Reidlinger, DP. Preparing our future workforce: a qualitative exploration of dietetics practice educators' experiences. *Journal of Human Nutrition and Dietetics* 2018. DOI TBC.



## **6.2. Abstract**

### **6.2.1. Background**

Dietetics practice educators are instrumental in the development of future dietitians. The aim of this study was to explore dietetics practice educators' experiences of, and challenges faced in, dietetics workforce preparation

### **6.2.2. Methods**

This study was guided by interpretive description methodology. Purposive and maximum variation sampling were used to recruit eighteen dietetics practice educators from a variety of practice areas and locations across Australia. In-depth, semi-structured interviews were digitally recorded then transcribed verbatim and inductive coding of data was managed with NVivo. Multiple researchers analysed the data to develop preliminary themes using template analysis before final themes were identified.

### **6.2.3. Results**

Three main themes – nurturing others; seeing the flaws; and soldiering on – were developed. Practice educators take great satisfaction in witnessing students develop and are focused on cultivating future practitioners with authentic learning activities. However, they are impacted by perceived shortcomings of the systems in which they operate and believe that broadening the scope of dietetics placements to better align with contemporary practice could benefit graduates and the profession. Despite these challenges, practice educators are pragmatic in getting on with their roles and recognise the advantages gained from student placements.

### **6.2.4. Conclusions**

Despite facing numerous challenges, practice educators derive benefits from their role in workforce preparation. Evidence is required on how students can demonstrate competence in

contemporary areas of practice and to enable the scope of student placements to be broadened. Such strategies could support practice educators to overcome challenges and help ensure the dietetics profession of tomorrow is relevant and responsive.

### **6.3. Introduction**

As multimorbidity rises<sup>1</sup> and the double burden of malnutrition continues to affect billions of people,<sup>2</sup> it is essential to ensure that the emerging dietetics workforce is well prepared to address these global challenges. Central to the process of developing future dietitians are dietetics practice educators. For the purpose of this study, the term ‘practice educator’ is used to describe those practitioners who have an active role in facilitating the learning and professional development of health professional students in a practice setting, and who may also be referred to as preceptors, supervisors, clinical educators and/or work-based teachers. In Australia, there is no mandated training, qualification or role definition for dietetics practice educators. Rather, dietetics education program accreditation standards require universities to ensure that practice educators are adequately prepared for their role.<sup>3</sup>

By simultaneously enacting the role of both practitioner and teacher, practice educators link academic and workplace settings, juggle multiple responsibilities and operate in increasingly challenging environments. The important role that practice educators play in preparing future practitioners is well-recognised across health disciplines including physiotherapy, occupational therapy and pharmacy.<sup>4-6</sup> In dietetics, they have been cited as the greatest source of student satisfaction on placement<sup>7</sup> and as role models who can influence students’ future careers.<sup>8,9</sup> However, diminishing health care resources, combined with rising student numbers and placement shortages<sup>10</sup>, are likely impacting practice educators’ abilities to effectively prepare the practitioners of tomorrow. Further, dietetics practice educators are likely to be challenged by increasingly diverse and evolving practice landscapes, as recently

described in Australia<sup>11</sup>, the UK<sup>12</sup> and the USA.<sup>13</sup> Despite a lack of robust data on both the emerging and existing dietetics workforce in Australia<sup>14-16</sup>, it has been suggested that new and emerging practice areas include private practice, the food industry and aged care<sup>17</sup> with private practice reported as one of the dominant areas where Australian dietitians currently work (P. King, Dietitians Association of Australia, email communication, 17 September 2018).

Research to-date has investigated dietetics practice educators' views on assessment<sup>18,19</sup>, placement settings<sup>20</sup>, supervision models<sup>21</sup>, and student preparedness.<sup>22</sup> It has often focused on single aspects of workforce preparation (e.g. assessment), in single areas of practice (e.g. clinical dietetics) and taken place in single locations (e.g. one city or state). Despite this existing body of evidence, there remains a lack of literature to describe the perspectives of dietetics practice educators from a range of settings and geographical areas regarding their overall experiences of preparing future dietitians.<sup>15</sup>

Qualitative explorations of key stakeholders in workforce preparation can provide richly-detailed insights into the phenomenon and enable the development of strategies for enhancing curricula and future practice. A recent study exploring a national sample of academic dietetics educators' experiences of preparing dietitians found that the numerous challenges facing these stakeholders may be addressed through collaboration and broad engagement of the whole profession.<sup>23</sup> To date, a national approach to investigating practice educators' broad experiences of preparing dietitians for the workforce has not been taken. This study aimed to explore dietetics practice educators' experiences of, and challenges faced in, dietetics workforce preparation.

## **6.4. Materials and methods**

### **6.4.1. Study design and researcher position**

This study was guided by a social constructionist epistemological position and an interpretive theoretical perspective<sup>24-26</sup> which employed an interpretive description methodology<sup>27</sup> and used interviews as the enquiry method.<sup>28</sup> Reporting was in line with Standards for Reporting Qualitative Research (SRQR) guidelines (Table S6-1)<sup>29</sup> and ethical approval was provided by the Bond University Human Research Ethics Committee. The research team comprised three dietetics educators (KM, KC & DR) and one health professions educator (SS) who were familiar with the challenges associated with working in health professional education. All researchers had experience in qualitative and health professional education research, including a similar study conducted with other key stakeholders in dietetics workforce preparation.<sup>23</sup> These experiences informed the research team's position that dietetics practice educators: were well-placed to be knowledgeable informants on the phenomenon of interest; and would likely have experienced challenges in preparing dietitians for the workforce.

### **6.4.2. Participants and recruitment**

Eligibility criteria required participants to: 1) be a dietetics practice educator affiliated with an Australian university dietetics program; 2) be involved in preparing dietitians for the workforce (i.e. a practice educator); and 3) have at least one year of experience as a dietetics practice educator. Purposive and maximum variation sampling were used to ensure a diverse and relevant sample of participants from a variety of practice areas and locations across the country who could provide in-depth accounts of their experiences.<sup>26,30</sup> Recruitment was initiated via a formal, national network of academic dietetics educators<sup>31</sup> with established links with dietetics practice educators. These academic educators (n=21) from the six states/territories where dietetics education programs are offered in Australia were asked to

either nominate or forward the recruitment request to suitable candidates from a range of practice areas. Candidates were emailed an explanatory statement, including informed consent and assurance of anonymity and confidentiality, along with an interview guide and contact details to arrange a suitable time for participation. Participation was incentivised with the opportunity to win a randomly-drawn gift voucher following data collection. Recruitment commenced February 2016 and ceased May 2016.

#### **6.4.3. Data collection**

The interview guide was adapted from (the authors') previous study<sup>23</sup> and was informed by the present study's aim, the research team's aforementioned position and a review of dietetics education literature which revealed a lack of published evidence on the topic. Following pilot testing with a dietetics practice educator, minor modifications were made to the wording of the questions. The final interview guide included ten open-ended questions designed to: obtain in-depth responses from participants about their experiences of dietetics workforce preparation; and enable researchers to interpret these experiences, gain an understanding of a complex phenomenon and yield practice applications (Table 6-1).<sup>27</sup> Participants provided demographic and professional characteristics via an electronic form emailed as part of the interview guide, so that the sample could be characterised. Interviews were semi-structured using the questions in the guide but with flexibility to probe, expand on or clarify questions as required.<sup>32</sup> Written informed consent was obtained and confirmed verbally prior to commencement of the interview. One researcher (KM) conducted each one-on-one interview via telephone which enabled participants, who were located across Australia, to select their desired setting (e.g. at work or at home). The digitally-recorded interviews were transcribed verbatim by a professional transcription service, then de-identified and checked for accuracy (KM) prior to analysis. Interviews lasted an average of 45 minutes (range: 24 to 64 minutes).

**Table 6-1** Questions guide used for in-depth, semi-structured interviews with dietetics practice educators

Question	Enquiry logic
1. Can you describe your own experience of being prepared as a dietitian for the workforce?	Own experience of workforce preparation
2. How prepared did you feel as a dietitian entering the workforce?	Own experience of preparedness
3. How did you come to be working as a practice educator / in dietetics workforce preparation?	Pathway into and motivations for work
4. Can you describe your experience of preparing dietitians for the workforce?	Experience of workforce preparation
5. Do you have a philosophy or approach that guides your work in preparing dietitians for the workforce, and if so, can you describe it?	Pedagogical approach and influences on workforce preparation
6. Can you describe any learning and teaching methods you use to prepare dietitians for the workforce?	Pedagogical practices and influences on workforce preparation
7. Can you describe any challenges that you face in your work to prepare dietitians for the workforce?	Own challenges faced in workforce preparation
8. Can you describe any challenges that you think are faced by the dietetics practice educator workforce in preparing dietitians for the workforce?	Views on challenges faced by others in workforce preparation
9. How prepared for the workforce do you believe graduate dietitians are today?	Views on preparedness of current graduates
10. Can you describe any challenges that you think are faced by dietitians entering the workforce today?	Views on challenges faced by graduates

#### **6.4.4. Data analysis and synthesis**

Transcripts were imported into NVivo, version 11<sup>33</sup> and analysis was carried out by two researchers (KM & DR). One researcher (KM) read each transcript multiple times to enhance familiarity with the data and performed open, inductive coding of the data.<sup>34,35</sup> The coding library and three transcripts that provided a diversity of participant views were reviewed by a second researcher (DR) prior to analysis. All codes were then exported to Excel and printed to enable visual mapping and grouping of codes into shared themes (Figure S6-1). Template analysis was employed whereby *a priori* themes previously developed in a similar study<sup>23</sup> were used as a template to initiate the analytic process with a subset of randomly-selected transcripts (n=8), which was then progressively modified as analysis of all data (n=18) proceeded and new themes arose.<sup>36</sup> This enhanced reflexivity by acknowledging the researchers' assumptions around themes developed in the previous study, while enabling new themes to be constructed.<sup>36</sup> Data analysis ceased when the researchers were satisfied that the study's aim had been addressed.<sup>37</sup> A third researcher (SS) cross-checked the preliminary themes against the same sample of transcripts (n=3) reviewed by the second researcher (DR) to enable multiple researcher perspectives.<sup>37</sup> Consensus was reached through discussion between all researchers involved in analysis (KM, DR & SS) and modifications made until final themes were agreed. No repeat interviews were conducted and participant checking of transcripts and themes was not employed.<sup>37</sup> Verbatim participant quotes were extracted and tabulated to illustrate themes and enhance interpretive validity.<sup>38</sup> Participant characteristics were collated and frequency distributions generated using SPSS, version 23.<sup>39</sup>

#### **6.5. Results**

Of 28 candidates nominated by academic educators, 18 dietetics practice educators provided informed consent. Three candidates did not respond to the request to participate and a further

seven responded but were not interviewed as adequate and appropriate data had been collected and analysed to address the study's aim.<sup>37</sup> Participants were all females with an average age of 38 years and were based across the six Australian states/territories where dietetics education programs were offered. The characteristics of participants were: Accredited Practising Dietitians (APDs) (83%; 15/18); employed full-time (72%; 13/18); held a Masters-level qualification (39%; 7/18); dedicated >30% of their role to training students (44%; 8/18); had 6-10 years of experience working as a dietetics practice educator (44%; 8/18); and whose main area of work as a dietetics practice educator involved individual patient care (61%; 11/18). Full characteristics of the participants are provided (Table S6-2).

From the initial codes identified in the data, three main themes and nine subthemes were developed (Figure 1). The three themes were: nurturing others; seeing the flaws; and soldiering on. The subthemes underpinning the main themes have been supported by illustrative, de-identified participant quotes (Table 6-2).

### **Nurturing others**

Within this theme participants took a nurturing, tailored approach with each student and selected learning activities that provided 'real-world' experiences to enhance students' preparedness. Practice educators' motivation for continuing their work in preparing dietitians was largely driven by seeing the progress of students as they developed during placements.

*Seeing them grow:* Practice educators were motivated by their enjoyment and satisfaction of seeing students grow and develop into competent dietitians. This generated a sense of satisfaction – knowing that they had contributed in some way, to a future practitioner's career. Most participants enjoyed educating and mentoring students and found



it ‘rewarding’, while some even preferred training students over their regular work. Some reported being naturally drawn to the practice educator role as they always had an interest in teaching and mentoring others. While many practice educators ‘fell into’ supervising or were required to do it as part of their job, some actively pursued the opportunity to train students. Only two participants described that students could be burdensome when the demands and pressures of their workload were high.

*Cultivating each practitioner:* Participants took a student-centred approach by recognising that each student was an individual with their own goals, interests and strengths. As opposed to taking the same approach with all students, practice educators focused on tailoring the placement experience to the student (e.g. learning styles and interests) and developing each student into a dietitian. The majority perceived that students had to take responsibility for their learning in order to get the most out of their experience. Some participants were motivated by their own experiences – rather than repeating the ‘bad’ experiences they had as a student, they wanted to create a valuable, positive experience for upcoming dietitians. This nurturing, tailored focus on student development reflected the participants’ approach to caring for their patients and clients which was similarly customised to achieving positive outcomes.

*Keeping it real:* A variety of practical, meaningful and hands-on activities that reflected ‘real’ dietetics practice were used by participants to help students link theory with practice and develop relevant skills to enhance work readiness. Some perceived it was necessary to prioritise student skill development, as knowledge was, and should be, mostly developed in the university setting. Didactic, instruction-based activities were viewed as less effective for student development. Practice educators encouraged students to take a client- and/or person-centred approach with activities that were also aimed at developing the student’s competence. Students were encouraged to use reflective practice to foster

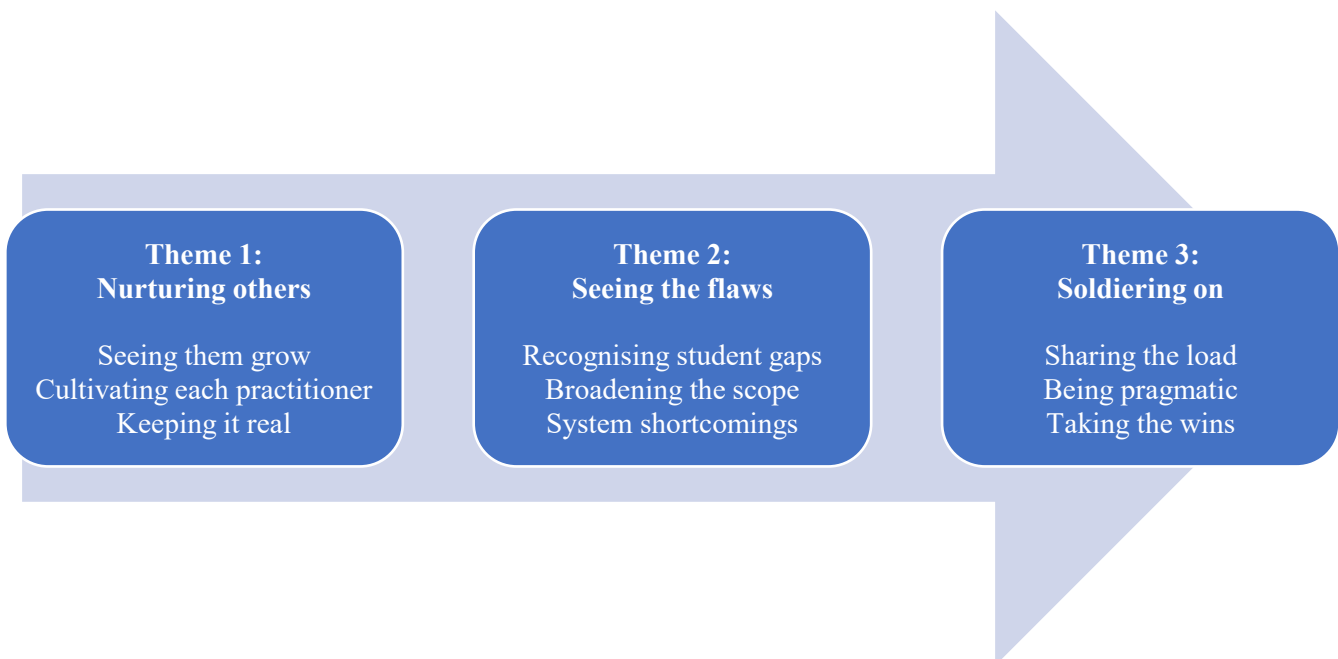
ownership of their learning. While some participants recognised that placement experiences could be stressful for vulnerable students and therefore tried to create an environment that was calm and conducive to learning, others liked to push and challenge students outside their comfort zone to facilitate growth. Conveying the ‘reality’ of the profession was extended beyond the placement site as some participants attempted to manage students’ expectations of the workforce and the competitive job market that awaited them upon graduation.

### **Seeing the flaws**

Within the second theme, practice educators reported that students were lacking attributes that could make them more effective practitioners. They believed that the scope of student placements needed to be broadened to enhance graduate employability. However, participants perceived that workforce preparation and preparedness was challenged and constrained by shortcomings of the systems in which they were embedded.

*Recognising student gaps:* Practice educators reported that students lacked people skills – attributes that weren’t necessarily essential to being a competent dietitian but that could make for more effective practitioners. This included a lack of: awareness of others’ situations; emotional intelligence; resilience; patient-centredness; drive or initiative; basic workplace knowledge/skills; and ownership of their learning. Conversely, two participants believed that students today had more initiative and independence than in the past. There was a divergence of views on professionalism, whereby six participants believed that students lacked professionalism, while three others believed that professionalism was now being addressed and assessed well. Practice educators described how some students had unrealistic expectations about their placements and displayed unpleasant attitudes i.e. they could be selfish, ungrateful and entitled. It was apparent that not all students were challenging but that the challenging students had a long-lasting impact on participants. While graduate

preparedness was perceived to be variable, it was largely dependent upon the individual student, their attitude and how well they could perform the role of a developing dietitian.



**Figure 6-1** Themes and subthemes identified from the analysis of practice educators' experience of dietetics workforce preparation\*

*Broadening the scope:* Almost all participants believed that students would be challenged by a perceived lack of jobs and oversupply of graduate dietitians entering the workforce. They described how students were generally well prepared for 'traditional' areas where there was an apparent shortage of jobs (e.g. clinical dietetics). However, they were less well equipped to work in areas where there appeared to be emergent opportunities (e.g. private practice). Some practice educators perceived that many graduates were moving into private practice out of necessity, and were largely unsupported in this setting, posing a risk to the profession. By contrast, graduates who managed to secure clinical positions in hospitals/acute settings were well supported by their dietitian colleagues. Many participants believed that this could be addressed by having students undertake training and placements in a broader range of dietetics practice areas than those outlined in program accreditation

\*The arrow indicates how themes were conceptualised by the authors and reflects the flow of experiences expressed by participants.

standards. Some practice educators believed that students needed earlier exposures to practice settings and/or more time on placements to enhance preparedness. Others also believed that students needed to be creative, open to new experiences and to think laterally about attaining work. Some participants attempted to improve graduate employability by providing diverse and varied experiences for students.

*System shortcomings:* The systems within which dietetics workforce preparation was embedded (i.e. health care settings, higher education institutions and the professional dietetics association) were recognised by participants as constraining the process of preparing future dietitians. Some participants perceived that the growing number of university dietetics education programs and subsequent increase in student numbers had created a supply of students that was outstripping placement capacity. Practice educators were challenged to give students quality placement experiences, and three participants perceived that student numbers should be regulated by the professional association or the government. Amplifying this perceived oversupply was the increasing expectation for health professionals to ‘do more with less’. Some participants reported that more funding for dietitian roles, practice educator positions and placements would contribute to better experiences for students. The inconsistent formal training provided and the lack of professional development opportunities available to help participants enhance their roles as practice educators were perceived as another shortcoming. Inconsistencies across placements were also seen as having a negative impact on future dietitians. While some reported that poor communication from universities and onerous assessment processes provided additional challenges, others described how both these issues had improved in recent years.

## **Soldiering on**

Despite facing many challenges, the third theme captured how practice educators were pragmatic in how they approached their work and ‘soldiered on’ with the job at hand. They described how training students was a responsibility that should be shared more amongst the entire practice educator workforce and the broader profession. It was also acknowledged that preparing students could benefit not only the educators themselves but also the profession and other stakeholders (e.g. communities).

*Sharing the load:* Practice educators reported that while only a small proportion of dietitians currently trained students, the practice educator workforce needed to come together more effectively to help each other out. Sharing the responsibility of preparing students among the broader workforce (e.g. by dietitians in other areas of practice) was also seen as a way of providing better quality placement experiences for students. The need for the professional association to have a greater role in supporting practice educators and placements was also prominent. This notion of sharing also extended to how practice educators, students, colleagues and universities either did, or could, effectively support each other throughout placements. Participants described how when students supported each other they contributed to each other’s development. Many recognised how working in a supportive environment with good communication and collaborative colleagues lightened the load of training students. Having adequate support from the university made the process of preparing students less onerous. One participant who was new to the role described feeling isolated while another two believed that if resources were shared more, it would benefit the entire practice educator workforce. Despite feeling ‘stretched’ in their capacity to prepare future dietitians, one participant reported that by involving practice educators and practitioners more in the university-based preparation of students (e.g. to provide guest lectures, orientation

information, workplace expectations) this would enhance the placement experience for the students, the university and the practice educators.

*Being pragmatic:* Despite being challenged to provide quality placement experiences for students, practice educators were pragmatic in their approach and accepted that challenges were ‘part of the process’ of preparing future dietitians. Taking this realist view of their role meant constantly trying to balance their time. That is, they attempted to deliver quality outcomes for patients/clients/communities as well as providing students with quality experiences that advanced their professional development. This had a personal impact on some participants who described trying to strike a balance between doing good work and ‘preserving’ themselves or preventing ‘burnout’. Managing students’ expectations of their placements and making students aware of their demanding workloads were strategies used by two participants to address this issue. Practice educators’ pragmatism was also reflected in their view that a university degree was unable to prepare graduates for every facet of professional working life. Many reported that while there were areas of workforce preparation in need of improvement, graduates today were as well prepared as they could be. Two participants perceived that the ‘real’ growth and development of students began after they had graduated and entered the workforce.

*Taking the wins:* Practice educators described the benefits or ‘wins’ that came with having students on placements. Many participants reflected that overall, their experience of preparing students was a positive one and that student training contributed to their own professional development. However, it was not just the practice educators themselves that were rewarded by students undertaking placements. Participants described how students could make valuable contributions to a workplace and increase that workplace’s capacity by completing useful projects. A mutually beneficial relationship was acknowledged with five participants describing how practice educators and students learned from each other, while

another three believed that students brought new skills and knowledge to the workplace. The benefits of having students on placements was also viewed from a 'bigger picture' perspective as eight participants hoped that they inspired students and subsequently had a positive influence on the profession.

**Table 6-2** Illustrative quotes from dietetics practice educators regarding their experience of preparing dietitians for the workforce

Theme and subthemes	Participant quotations
1. Nurturing others	
1a. Seeing them grow	<p><i>“Just seeing them grow, from when you first have them, they have actually no idea about anything. Every time when you teach them something, they get as excited about the profession as you are, and by the end of the placement they say they really want to be a dietitian.”</i> PE047</p> <p><i>“You don’t really get to see your patients get better, you see them just til they’re okay. With students, I really find it rewarding seeing that what you’ve put in, you can see the results. And I think that’s one of the reasons why I’m so attracted to (the role) is that you can see where your hard work is going. And then you hope that those experiences that the students had, they then give that on to their students.”</i> PE044</p> <p>Divergent view:</p> <p><i>“I have seen students broken by supervisors and it’s horrible. It’s not because the supervisors are horrible people, it’s just that they are frustrated with their expectations of their job and all the demands that comes with supervising students.”</i> PE053</p>
1b. Cultivating each practitioner	<p><i>“Students need to be really clear about their strengths and their limitations and where they’re at and where they want to be going to, so they are responsible for their learning as much as their placement supervisor is, because if they’ve got a real passion around an area of nutrition, then placement supervisors can certainly tailor some of that experience and helping them to be more prepared for the workforce.”</i> PE064</p> <p><i>“(my philosophy or approach) it’s learner-centred, so it’s student-focused. And I think ‘what kind of dietitian do they want to be?’ and if that’s what they’re aiming for, then let’s support them to get them there, not where we think they need to be. As long as they meet their competencies.”</i> PE044</p>



Theme and subthemes	Participant quotations
1c. Keeping it real	<p><i>“The (placement) projects need to be really meaningful, real life projects...a lot of what I try and do with them is not so much theory stuff, but practical and about communication and working in a team and project planning and project management...things that are a bit more practical, and I guess about applying knowledge.” PE064</i></p> <p><i>“One lot of the students, we had them working on a food security project...and they had to travel, they said they’d driven...the whole length of (the state), and by doing that, they were actually able to see the country, talk to different types of people and get a broad experience of what it was like to actually work in the country. Whereas, if we shut them in the public health unit, or an office to do a project, they don’t get to actually go outside, to see what a small country town is...they need to be seeing what the dietitians are actually doing.” PE054</i></p>

Theme and subthemes	Participant quotations
2. Seeing the flaws	
2a. Recognising student gaps	<p><i>"I don't know whether they're just getting less tough but they take a while to adjust to having to work nine to five and having multiple tasks and don't really get how to prioritise. It's such a shock for them to enter a workplace, and just attending big staff meetings, all that kind of thing was a bit of an adjustment for them. They get really tired and weary by the end of the week"</i> PE060</p> <p><i>"A couple of years ago we had some new grads making patients buy really expensive supplements and not realising that those supplements might cost them a quarter of their pension. I feel that the new graduates might be really smart, but they still lack that common sense, they don't really understand money and why people might not have enough money for food."</i> PE053</p> <p>Divergent view:</p> <p><i>I think (graduates are) a lot more prepared in that adult style of learning...I think they're more independent, I think they're coming out questioning a lot more now and showing initiative and getting in there and giving things a go."</i> PE048</p>
2b. Broadening the scope	<p><i>"I think the workforce has changed a lot...the competition for jobs is a big challenge and because there are so many people graduating each year, a lot of them are going into private practice...and I think that they haven't had enough experience, or they don't have enough support to really be successful straight up in those sorts of roles."</i> PE048</p> <p><i>"...having opportunities (for students) to see the variety of areas that you can work in as a dietitian and doing that throughout their degree not just towards the end, so that they can have an opportunity to develop mentors and people who are in the workforce and think about how they can work towards a role like that."</i> PE042</p>

Theme and subthemes	Participant quotations
2c. System shortcomings	<p><i>“Patient population has grown exponentially...my clinical load, it’s huge. I can’t keep on top of that, never mind supervise students. I know I have to give back. Often, I feel like I would like to give back, but it’s actually having quality time for the students and patients, without feeling like I am going to have a breakdown...The challenge is the increasing demands that the health district puts on us, they want blood out of a stone.” PE053</i></p> <p><i>“Talking about training dietetics students, it’s a core part of what the future generation is...I know some sites do (professional development) for whoever wants to do it...but I think more resources should be put into standardising the training of supervisors...because, I’m sure different hospitals, different universities, different states train students slightly differently.” PE047</i></p>

Theme and subthemes	Participant quotations
<b>3. Soldiering on</b>	
3a. Sharing the load	<p><i>“when you’re part of a supportive team, that will then share the load...if you're really fortunate, you have a team of people you work with who are more than happy to be involved in providing additional experiences or support or even just making the environment nice for students.”</i> PE045</p> <p><i>“Once a week the supervisors, get together and discuss the students, then the clinical (lead) educator has a chat with all the students, the students then get to talk to each other about what they think they’ve done well. It works really well from a supervisor point of view, so you don’t feel so alone, it works well when we’ve got young supervisors and older supervisors, it’s like a little focus group every week, and the students also get to see where they are at.”</i> PE053</p>
3b. Being pragmatic	<p><i>“they’re not really challenges, they’re just part of the process”</i> PE054</p> <p><i>“It’s not (about whether) they’re well prepared or not, it’s just that those kinds of skills need to be developed. You cannot expect a new graduate to be able to advocate, or perform a lot of project management, or they can be empathetic, or they may not be having a high level of emotional intelligence and knowing what to do in certain situations. I think it’s more about the maturity of students. I don’t think the dietetics course itself can actually train every single domain of what the dietetic competencies can be.”</i> PE047</p>
3c. Taking the wins	<p><i>“My overall experience in supervising has been positive because (the students) just bring an awesome amount of resources to get jobs done. They have fresh ideas and achieve a lot.”</i> PE058</p> <p><i>“I love that it keeps me on my toes, makes me reflect on my own practice all the time...I never stop learning...sometimes (students) have different perspectives from me so it makes me think...they keep us up to date, they bring different ideas, it’s almost like a symbiotic relationship. We learn from them, they learn from us...they give us patience, and tolerance and kindness...it’s that feeling of being able to give back to your profession, because you were probably the same, you had some (supervisors) that were great and some that weren’t so great, and you think, ‘I want to be one that they remember, that helped them’”</i> PE053</p>

## 6.6. Discussion

This study explored dietetics practice educators' experiences of preparing dietitians for the workforce, and is the first such study to take a national approach with a focus on in-depth perspectives. It provides valuable insights into the phenomenon of dietetics workforce preparation. The three themes developed from the data – nurturing others; seeing the flaws; and soldiering on – reveal that while practice educators take great satisfaction in cultivating future practitioners with authentic learning and development activities, they are impacted by perceived shortcomings of the systems in which they operate. They believe that graduate preparedness, and the profession, could benefit from the scope of dietetics placements being broadened to better align with contemporary practice and graduate work opportunities. Despite these challenges, practice educators recognise the advantages gained from student placements and are pragmatic in getting on with their roles.

Participants in this study were driven by a desire to see students grow into emerging health professionals and derived benefits from preparing students – a phenomenon reported across many health disciplines.<sup>40</sup> Given that practice educator motivation can be impacted by a lack of time<sup>41</sup> and that educators are likely to continue being asked to 'do more with less',<sup>23</sup>, leveraging this motivation is crucial. Showcasing exemplar educators and placement projects which can benefit stakeholders (e.g. educators, students), their workplaces and their clients/communities, could incentivise more dietitians to become practice educators, especially in regions where supervisors/preceptors are urgently needed.<sup>42</sup> Awards programs, such as those available for dietetics practice educators in the USA<sup>43</sup>, could also incentivise dietitians in academic and practice settings to collaboratively develop projects where new opportunities for placements are required to enhance career opportunities for upcoming dietitians.<sup>12,44,45</sup>

The cumulative shortcomings of the systems in which they operated meant that participants were increasingly stretched to provide students with quality experiences. These were exacerbated by the inadequate training and inconsistent placement processes described by participants here, and apparent in other countries.<sup>46,47</sup> Supporting educators to more effectively prepare dietitians could result in better quality placements, greater student autonomy, and better prepared graduates. This would require an audit of existing professional development and training resources across the country which could be centralised for the benefit of all educators to promote consistency, collaboration and good practice. National networking events, virtual discussions and online platforms could be similarly coordinated and valued by practice educators. Communities of practice established in dietetics education provide one example of how stakeholders across the country can come together to advance practice, disseminate resources and address shared concerns.<sup>31</sup>

Participants' views that graduate preparedness could be enhanced to better match future workforce needs by enabling students to undertake placements in broader, emerging and more contemporary areas of practice, rather than just in traditional ones, echoes calls by academic dietetics educators,<sup>23</sup> dietetics students,<sup>45,48</sup> and other dietetics researchers.<sup>20</sup> In many countries where sourcing appropriate placements has become an increasing challenge and rigid accreditation processes are limiting placement flexibility, fresh approaches to training students are needed.<sup>49</sup> Despite intentions to move away from a prescriptive approach to placement settings,<sup>17</sup> program accreditation guidelines and standards of proficiency still mandate the practice settings for students to demonstrate competence (e.g. clinical dietetics, public health nutrition and food systems management).<sup>50,51</sup> While a body of evidence exists to support the benefits of placements in emerging and underserved areas for other health professions,<sup>52,53</sup> their implementation in dietetics is limited.<sup>20,54,55</sup>

Educators in health care and higher education systems are likely to continue to experience placement-related issues including shortages,<sup>56,57</sup> high demand,<sup>21,58,59</sup> and funding cuts.<sup>60</sup> In addition, dietetics student numbers are unlikely to be regulated. Therefore, alternative ways of conceptualising and approaching perceived challenges is required. For example, students' expectations about their placements and future work roles could be managed by practice educators coaching them on embracing opportunities in an evolving profession. In addition, placement models that can maintain or enhance placement quality along with practice educator capacity and graduate attributes<sup>61,62</sup> could be trialled, adopted and evaluated. Taking a solutions-focused approach to addressing such challenges aligns with the pragmatic mindset demonstrated by participants in this study.

Practice educators' endeavours to keep experiences real, relevant and varied are consistent with the views of other stakeholders in dietetics education.<sup>23</sup> This affirms the unique role of practice educators in enabling students to translate theory into practice and highlights their capacity to enhance graduate work readiness. In addition, participants' perception that dietetics students lack skills, such as resilience, may reflect concerns of leaders in the profession about education programs not responding to market needs and producing too many graduates with irrelevant skills.<sup>63</sup> Given the identified need to build adaptable future workforces<sup>64</sup> and the increasingly competitive and challenging landscape facing dietetics, ensuring that emerging dietitians are equipped with traits such as resilience is paramount to the profession's effectiveness.

A strength of this study was that it obtained insights from a national sample of dietetics practice educators with varying levels of experience in a range of practice areas and from diverse geographical locations. While findings from this study may not reflect the perspectives of all dietetics practice educators, this sampling approach helped to enhance theoretical generalisability or transferability to other contexts.<sup>37,65</sup> Having one researcher

conduct all interviews enhanced consistency, verbatim transcripts and field notes helped ensure confirmability<sup>28</sup> and the *a priori* interview guide minimised researcher influence on participants while ensuring descriptive validity.<sup>38</sup> Robust discussion around all themes and subthemes allowed researchers to acknowledge their position and influence on the study's findings (reflexivity).<sup>24,37</sup>

While sampling methods aimed to limit selection bias, practice educators who have had particularly positive or negative experiences of dietetics workforce preparation could have been motivated to participate. While having a second researcher code all transcripts may have further strengthened interpretive validity,<sup>38</sup> transcript auditing and incorporating multiple researchers' perspectives in data analysis promoted dependability<sup>28</sup> and enabled a thorough interpretation of the data.<sup>37</sup> Non-respondents were not followed up to ascertain reasons for not participating, although one later cited a lack of time for their inability to take part. The sample size used in this study is consistent with accepted qualitative research methods and should not be viewed as a limitation.

These findings have important implications for all stakeholders involved in dietetics workforce preparation and for the entire dietetics profession. The efforts of dietetics practice educators and the advantages gained from student placements must be recognised and celebrated. There is an obvious and pressing need to evidence how dietetics students can develop and demonstrate competence in broader, emergent and contemporary areas of practice. Development and trialling of new placement strategies, as well as non-traditional and role-emerging settings could assist with overcoming challenges of meeting placement and graduate employment demand. In addition, future research may help to understand the factors that could incentivise practice educators to trial and implement alternative placement models.



### **6.6.1. Conclusions**

Dietetics practice educators are instrumental in shaping the dietetics workforce of the future and the health of those who stand to benefit from its services. They are motivated by student development and are pragmatic in their approach. However, they are challenged by shortcomings of the systems in which they operate, a lack of formal training, support and recognition, and gaps in students' attributes. Evidence is required to support the broadening of dietetics student placements and to ensure that emerging dietitians are relevant and responsive to market needs. Ongoing exploration of key stakeholders' (e.g. educators, students, graduates, clients, employers) broad experiences of dietetics workforce preparation and preparedness will help to further illuminate challenges faced and enable targeted solutions to be developed and actioned.

### **6.7. Disclosures**

The authors declare that they have no conflict of interests.

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## **Chapter 7.      Exploration of Recent Dietetics Graduates’ Experiences**

## 7.1. Preface

This chapter explored recent dietetics graduates' experiences of, and challenges faced in, dietetics workforce preparation and preparedness in Australia. As key stakeholders in dietetics education, recent dietetics graduates represent the future of the profession and are well-placed to provide insights into the phenomena of interest.

A review of the literature indicated that the experiences of recent dietetics graduates have been explored to a limited extent. Their perspectives have been sought on individual aspects of dietetics education programs (e.g. placement and mentoring activities). However, a national approach to exploring recent dietetics graduates' experiences in Australia had not been taken. In-depth, semi-structured interviews with recent dietetics graduates from across Australia were therefore necessary.

Data collected in this study was collated and interpreted along with the two preceding qualitative studies regarding academic dietetics educators' and dietetics practice educators' experiences of workforce preparation and preparedness (Chapters 5 & 6).

This chapter contains the submitted version of an original manuscript currently under review in a peer-reviewed journal. The formatting of this manuscript is consistent with the thesis style. References for this manuscript appear at the end of the chapter and supplementary tables and figures appear in the appendices at the end of the thesis.

Citation:     **Morgan, K**, Campbell, KL, Sargeant, S, Reidlinger, DP. Preparedness for advancing future health: a national qualitative exploration of dietetics graduates' experiences. *Advances in Health Sciences Education* 2018. (Under review)

## **7.2. Abstract**

### **7.2.1. Background**

Effective health workforce preparation is critical to the health of those who stand to benefit from its services. Emerging dietitians can provide important insights on an evolving workforce that is well-placed to advance future global health. This study aimed to explore a national sample of dietetics graduates' experiences of, and challenges faced in, dietetics workforce preparation and preparedness in Australia.

### **7.2.2. Methods**

An interpretive description methodology guided this study whereby researchers interpreted the meanings that participants attributed to their experiences. Twenty dietitians (graduated within the last two years) were purposively sampled from across Australia and detailed insights were obtained through semi-structured interviews. A multi-analyst approach employing thematic and template analysis, enabled five themes to be identified across the data set.

### **7.2.3. Results**

The main themes identified were: 1) being held back; 2) chasing the prize; 3) valuing real learning; 4) easing the transition; and 5) encountering influencers. While graduates appreciated their preparation, they were not empowered or equipped to embrace opportunities in diverse and emerging areas of dietetics practice. Graduates were challenged by the competitive landscape of securing obvious job opportunities and by a lack of support in transitioning into the workforce. Practice exposures and encounters with influential dietitians were highly valued.

#### **7.2.4. Conclusions**

To ensure that the emerging dietetics workforce is to responsive and relevant to future workforce and health needs, dietetics education programs and the standards that underpin them must respond accordingly. Research on role-emerging dietetics placements along with enhanced support mechanisms for novice dietitians is urgently required to ensure appropriate alignment between future dietetics preparation and practice.

### **7.3. Introduction**

The double burden of malnutrition now affects around a third of the world's population<sup>1</sup> and rates of diet-related chronic disease continue to rise.<sup>2,3</sup> Emerging evidence also demonstrates the association between nutrition and the increasing international issue of multimorbidity.<sup>4</sup> Given the clear role nutrition plays in achieving optimal health throughout the life course,<sup>5</sup> the emerging dietetics workforce is well-placed to impact future health globally. Preparing dietitians who are equipped to address this challenge is critical to advancing nutrition-related health in all regions of the world. However, little has been reported about the effectiveness of the emerging dietetics workforce and the education programs attempting to prepare it.

Dietetics is a health profession that has grown substantially in recent years<sup>6,7</sup> and is witnessing a significant expansion in breadth of practice areas.<sup>8-10</sup> Therefore, the dietetics workforce and the outcomes of its preparation warrant attention. In Australia, graduates of accredited dietetics education programs must demonstrate competence through a Bachelor-level degree at minimum, which includes 100 days (~400 hours) of practice placement experience.<sup>11,12</sup> In order to satisfy credentialing requirements to become an Accredited Practising Dietitian (APD), graduates must participate in a year-long mentoring partnership as a 'provisional' dietitian followed by continuing professional development.<sup>13</sup> As a non-registered profession, dietetics does not benefit from the workforce data collection services

afforded to registered health professions in Australia.<sup>14</sup> A lack of robust workforce data has been widely acknowledged as an ongoing issue in evaluating this emergent profession.<sup>6,15,16</sup>

As key stakeholders embedded in the phenomena, recent graduates are ideally-situated to provide insights into their preparation and preparedness for practice. Further, given the marketisation of university degrees and rise of the ‘student-as-consumer’ approach in higher education,<sup>17,18</sup> graduate perspectives on their training should be valued by health professional educators. Since the Institute of Medicine<sup>19</sup> reported that health professional graduates were not adequately prepared to practice, a body of evidence regarding graduate preparation and preparedness has emerged across many health disciplines. This includes medicine,<sup>20-23</sup> nursing,<sup>24,25</sup> physiotherapy,<sup>26,27</sup> occupational therapy<sup>28,29</sup> and pharmacy.<sup>30,31</sup> Few of these studies have taken a national approach, with most sampling graduates (or sometimes students) from a single university or within states/regions of a country. In addition, perspectives provided in many studies have focused on a specific aspect (e.g. preparedness for working in one area of practice) or have been restricted to a quantitative survey with open-ended comments yielding minimal understanding about individuals’ experiences.

Existing scholarship in dietetics on this topic is similar. Qualitative investigations of recent graduates’ experiences of their preparation and/or preparedness have focused on specific aspects such as placements,<sup>32</sup> assessment,<sup>33</sup> mentoring,<sup>34</sup> and professional identity development.<sup>35</sup> Graduates perceptions on their preparedness for practice have also been investigated through surveys which have provided limited in-depth insights.<sup>36,37</sup> Other key stakeholders in dietetics workforce preparation, including academic and practice educators, have provided their views on the issues faced by recent dietetics graduates in Australia. These studies have revealed that newly-qualified dietitians are likely challenged by competition for jobs due to an apparent oversupply of graduates prepared for mostly ‘traditional’ areas (e.g.

clinical dietetics) which has been attributed, in part, to rigid program accreditation requirements.<sup>38,39</sup> While these insights are valuable, it is the richly-detailed descriptions obtained through qualitative explorations of those individuals who have experienced the phenomena themselves (i.e. graduates) which hold great value.

A national approach to investigating newly-qualified dietitians' broad experiences of their education and work-readiness is lacking. The aim of this study was to explore recent dietetics graduates' experiences of, and challenges faced in, dietetics workforce preparation and preparedness in Australia.

## **7.4. Materials and methods**

### **7.4.1. Study design and researcher position**

This qualitative study adopted a social constructionist epistemological position (that multiple realities are constructed by research participants' through their social interactions) and an interpretive theoretical perspective (that meaning is derived from how the research participants interpret their experience of a phenomenon).<sup>40-42</sup> Applying an interpretive description methodology enabled researchers to capture themes and patterns in the data by interpreting participants' subjective experiences and gaining an understanding of a complex phenomenon.<sup>43,44</sup> In line with the above approaches, interviews were the chosen enquiry method.<sup>45</sup> Data were also considered against the theoretical framework of self-determination theory (that individuals are intrinsically motivated by the satisfaction of their need for fulfillment) in order to understand the motivations driving participants' behaviour.<sup>46,47</sup>

The research team consisted of four females – all who were health professional educators in higher education institutions working in the discipline of dietetics (KM, DR & KC) or health sciences (SS). All researchers were experienced in qualitative research and had previously been involved in similar studies which investigated the experiences of

stakeholders (i.e. academic educators, practice educators) in dietetics workforce preparation.<sup>38,39</sup> Given these experiences, the researchers were of the view that recent dietetics graduates could have valuable insights to share regarding dietetics workforce preparation and preparedness. The reporting of this study was guided by the standards for reporting qualitative research (SRQR) (Table S7-1).<sup>48</sup> Ethical approval was obtained from the Bond University Human Research Ethics Committee.

#### **7.4.2. Participants and recruitment**

In order to sample informants who were well-placed to describe their experience of the phenomenon of interest, participants were required to: 1) be a graduate of an accredited dietetics program in Australia; and 2) have completed their dietetics qualification within the two years prior to this study commencing. Participants could have been working as a dietitian or otherwise and could have been located in any state or country. Recruitment began in April 2016 and was completed by May 2016. Purposive and maximum variation sampling were used to ensure a national sample of eligible participants from a variety of sites across the country who could provide pertinent insights to address the research aim<sup>49,50</sup> and to enhance transferability.<sup>51</sup> Invitations to participate in the study were electronically distributed via the Dietitians Association of Australia (DAA) weekly member newsletter (n≈ 6,269) and to relevant DAA member interest groups (e.g. the Emerging Dietitians Interest Group), as well as through the weekly newsletter of an Australian-based, international network of dietitians (n≈6,000) (Dietitian Connection). Those who expressed interest in participating were emailed an explanatory statement (including details of the study and assurance of confidentiality) as well as an interview guide. Respondents were asked to contact the primary researcher (KM) to arrange a time for their interview. Informed consent was obtained from all individual

participants included in the study. To help incentivise participation, participants were offered the opportunity to win one of two randomly-drawn gift vouchers.

#### **7.4.3. Data collection**

In-depth, semi-structured interviews with each individual participant were all conducted by the primary researcher (KM). The interview guide was adapted from a recent study conducted with other key stakeholders involved in dietetics workforce preparation.<sup>39</sup> Questions were: designed to address the study's aim; influenced by the research team's approach and positionality; and informed by a lack of evidence regarding dietetics graduates' broad experiences. The interview guide was piloted with one dietetics graduate and minor modifications were made to phrasing to enhance question clarity. The final interview guide included seven open-ended questions designed to capture detailed insights from participants about their experiences (Table 7-1). At the commencement of the interview, participants were asked to verbally confirm their informed consent. To ensure that the sample could be described, participants were also asked to answer closed questions regarding demographic information and professional attributes. The semi-structured nature of the interview meant that question order could be modified and question phrasing could be expanded or clarified by the interviewer as required. Interviews were conducted via telephone (as participants were located in different settings across Australia) at a time that was mutually convenient for interviewee and interviewer (who were not known to each other prior to the study). Field notes were made (KM) throughout and shortly after each interview to enhance confirmability, highlight key responses and record relevant researcher thoughts. Interviews lasted between 26 and 63 minutes (average: 36 minutes) and were digitally recorded then de-identified before being provided to a professional transcription service. The primary researcher (KM) listened to each audio recording and checked the accuracy of each transcription prior to analysis.



**Table 7-1** Interview guide for exploring dietetics graduates' experiences of workforce preparation and preparedness

Question	Enquiry logic
1. How did you come to be studying nutrition and dietetics at university?	Pathway into and motivations for becoming a dietitian
2. Describe your experience of being prepared as a dietitian for the workforce in Australia	Own experience of workforce preparation
3. Describe the learning & teaching methods that were used to prepare you for the dietetic workforce	Pedagogical exposures and influence on preparation
4. Describe any challenges that face dietetic students being prepared as dietitians for the workforce	Views on challenges faced by self and others during preparation
5. Describe your experience of being a dietetic graduate entering the workforce	Own experience of entering workforce
6. How well prepared did you feel as a dietitian entering the workforce?	Views on own preparedness for practice
7. Describe any challenges faced by dietetic graduates entering the workforce today	Views on challenges faced by self and others in entering workforce

#### 7.4.4. Data analysis

Thematic analysis, as described by Braun and Clarke,<sup>52</sup> guided the development of themes from the data and was carried out primarily by two researchers (KM & DR) with another researcher (SS) cross-checking their findings and providing additional perspectives. To aid analysis, verbatim transcripts were imported into QSR NVivo (Version 11). Each transcript was read multiple times by the primary researcher (KM) who then conducted open, line-by-line coding of each transcript.<sup>52</sup> All codes in the final coding library (n=333) were exported to a word processing document and printed to enable visual mapping of codes and the inductive development of themes into meaningful clusters (Figure S7-1). Prior to analysis, a second researcher (DR) reviewed a sample of transcripts from participants with a diverse range of views (n=5) as well as the entire coding library to enhance familiarity with the participants' perspectives. To acknowledge the likely influence of findings from the previous, similar studies that the research team had been involved in (with dietetics students, educators and

supervisors), template analysis was incorporated.<sup>53</sup> Here the themes and subthemes from those studies acted as an *a priori* template for initiating the analytic process. Over a series of meetings, two researchers (KM & DR) analysed a randomly-selected subset of data (n=8) which provided a sound cross-section of participant experiences against the template. Where existing themes did not confer a good fit, they were modified into new preliminary themes that captured the major recurrent patterns occurring throughout the data subset. Researchers then commenced inductive analysis with the entire data set (n=20), whereby the preliminary themes were applied to all codes until theoretical sufficiency was reached and the research aim was addressed.<sup>54</sup> Multiple meetings and discussions took place as themes and subthemes were modified, progressed and refined. To enhance dependability that the findings ‘fit’ the data<sup>51</sup> and to enable multiple researcher perspectives,<sup>54</sup> a third researcher (SS) reviewed a sample of transcripts (n=5) against the themes and subthemes that had been developed. Minor adjustments were made until all researchers (KM, DR & SS) reached consensus that the themes and subthemes provided an accurate representation of the data and the study’s aim had been addressed. Verbatim quotes that captured the meaning behind the themes and subthemes were extracted from the participants’ transcripts and tabulated to enhance confirmability.<sup>51</sup> Participant checking of transcripts or themes was not carried out nor were any repeat interviews conducted with participants. Participant demographic information was manually entered into SPSS (Version 23) to generate frequency distributions of the sample’s professional characteristics.

## **7.5. Findings**

Twenty recent dietetics graduates provided informed consent and participated in the study. A further thirty-one responded to the invitation to participate but were either not required due to sufficient data being collected to address the study’s aim (n=5) or did not respond further

once additional information about the study was provided (n=26). The majority of participants were female (90%; 18/20) provisional Accredited Practising Dietitians (APDs) (65%; 13/20), who were employed as dietitians (90%; 18/20) on a full-time basis (65%; 13/20). One quarter (5/20) had completed their dietetics degree in the state of Victoria and the average age of participants was 30 years. Participants worked in a diverse range of settings with the main areas of practice since graduating being clinical (20%; 4/20) and private practice (20%; 4/20). Full characteristics of the participant sample is provided (Table 7-2).

Analysis identified five main themes from the data: 1) being held back; 2) chasing the prize; 3) valuing real learning; 4) easing the transition; and 5) encountering influencers. De-identified participant quotes were selected to convey the meaning captured within the themes and to illustrate the subthemes that underpinned them (Table 7-3). The themes and subthemes are described below and graphically presented (Figure 7-1). The terms ‘student’ and ‘graduate’ are used interchangeably as participants were reflecting on their experience of being both a student (preparation) and a graduate (preparedness).

### **Being held back**

The first theme captured the sentiment that graduates felt they were being held back by their preparation. While graduates generally enjoyed their preparation and reflected on their experience with gratitude, they also felt short-changed and constrained by their degrees. Participants described how they were prepared for only a narrow range of dietitian roles and were not well-equipped to embrace wider opportunities.

#### **Appreciating preparation**

Within this subtheme, graduates expressed enjoyment of, and gratitude for, their preparation. Some reported feeling generally well prepared for practice and as though they had a solid

foundation upon which to build as a dietitian. In particular, participants felt their programs prepared them well for practice in the area of clinical dietetics. A sense of satisfaction and fulfillment was gained from developing as a nutrition professional and participants reflected ‘fondly’ upon their degrees, with some even defending and commending their university for its efforts. Despite appreciating their preparation, participants also recognised there were elements of their degrees which constrained their potential.

#### Feeling let down

Participants expressed a sense of disappointment and frustration regarding the perceived shortcomings of their preparation. This was due, in part, to graduates’ expectations of the workforce not being managed, with some feeling misled or uninformed about the challenging nature of securing work as a graduate dietitian. Some reported that while they were informed about the ‘reality’ of the workforce, it came too late in their degrees. Graduates felt constrained by their preparation and not empowered to create work opportunities. They also were not encouraged or supported to network with each other or with dietitians in practice. Some participants described feeling short-changed in that their preparation lacked depth, it was misaligned with practice and that addressing mandated competencies/ticking off tasks was prioritised over more meaningful professional development.

#### Missing opportunities

Many participants expressed frustration that their degrees had a narrow focus and overemphasis on clinical dietetics which meant they were not prepared for work outside of traditional areas. For example, they described feeling underprepared for establishing a business, for working in a private practice or for counselling patients in a community outpatient setting. This meant that graduates were not well equipped and were missing

opportunities to pursue work in emergent areas. While the challenge for university degrees to fit these ‘missing’ aspects into already full curricula was acknowledged, participants felt that changes to reflect workforce needs was necessary. In addition, graduates frequently referred to their overall preparation and preparedness in relation to three main areas of practice (i.e. clinical, community and/or public health, and food service) while acknowledging that ‘other’ opportunities outside these areas existed.

### **Chasing the prize**

Graduates’ efforts to chase the elusive prize of securing work as a dietitian was apparent within the second theme. A perceived excess supply of graduates and low demand for obvious graduate roles, saw graduates ardently competing against their peers. While this took an emotionally-draining toll on graduates, others who made intentional efforts to differentiate themselves reaped the rewards of their endeavours.

### **Competing with others**

This subtheme captured the widely-expressed sentiment that graduates were challenged to secure work and obtain employment. The perceived oversupply of graduating dietitians meant that the job market was flooded with dietetics graduates who found the search for work highly competitive. One participant even described how this intense competition had impacted peer friendships and collegiality. Despite acknowledgement by some participants that there was a need for more dietitians in today’s workforce, it was the lack of obvious (advertised) job opportunities that was problematic. Some felt that the professional association and/or universities were exacerbating the issue by producing a surplus of graduates with similar skills and that student numbers needed to be regulated. Divergent

views were expressed by some graduates who found securing work easy and felt that graduates were putting unnecessary pressure on themselves in their quest for a job.

### Unrelenting knocks

The emotional toll of the difficulties graduates experienced in securing work was described as stressful, demoralising, depressing and daunting. Despite being enthusiastic and feeling ready to embrace work, participants were challenged by the seemingly insurmountable task of gaining paid work/employment as a dietitian. Some participants were disheartened by receiving many rejections from job applications, by having to apply for non-dietetics positions and by feeling unprepared to apply for some roles. Several expressed a potentially divergent view that finding work was quick and easy. However, those who did secure work with relative ease, felt fortunate as they knew many of their peers were struggling to do the same. Some graduates moved to another state/territory and others begrudgingly changed their career preferences in an attempt to obtain any kind of dietetics work.

### Reaping the rewards

Those participants who took ownership of their situations and showed initiative in their workforce transitions, reaped the benefits of their endeavours. They recognised early in their preparation that students and graduates who went ‘outside the box’ and differentiated themselves, were able to enter the workforce with ease and initiate a successful career. Some believed that despite the competition for obvious/advertised jobs, many opportunities for working as a graduate dietitian existed, they just needed to be created and pursued. However, some of these enterprising graduates still viewed themselves as ‘lucky’ to have readily secured work, in comparison to the majority of their peers. Participants reported taking strategic action to ‘fill the voids’ of their degree while they were still at university to enhance

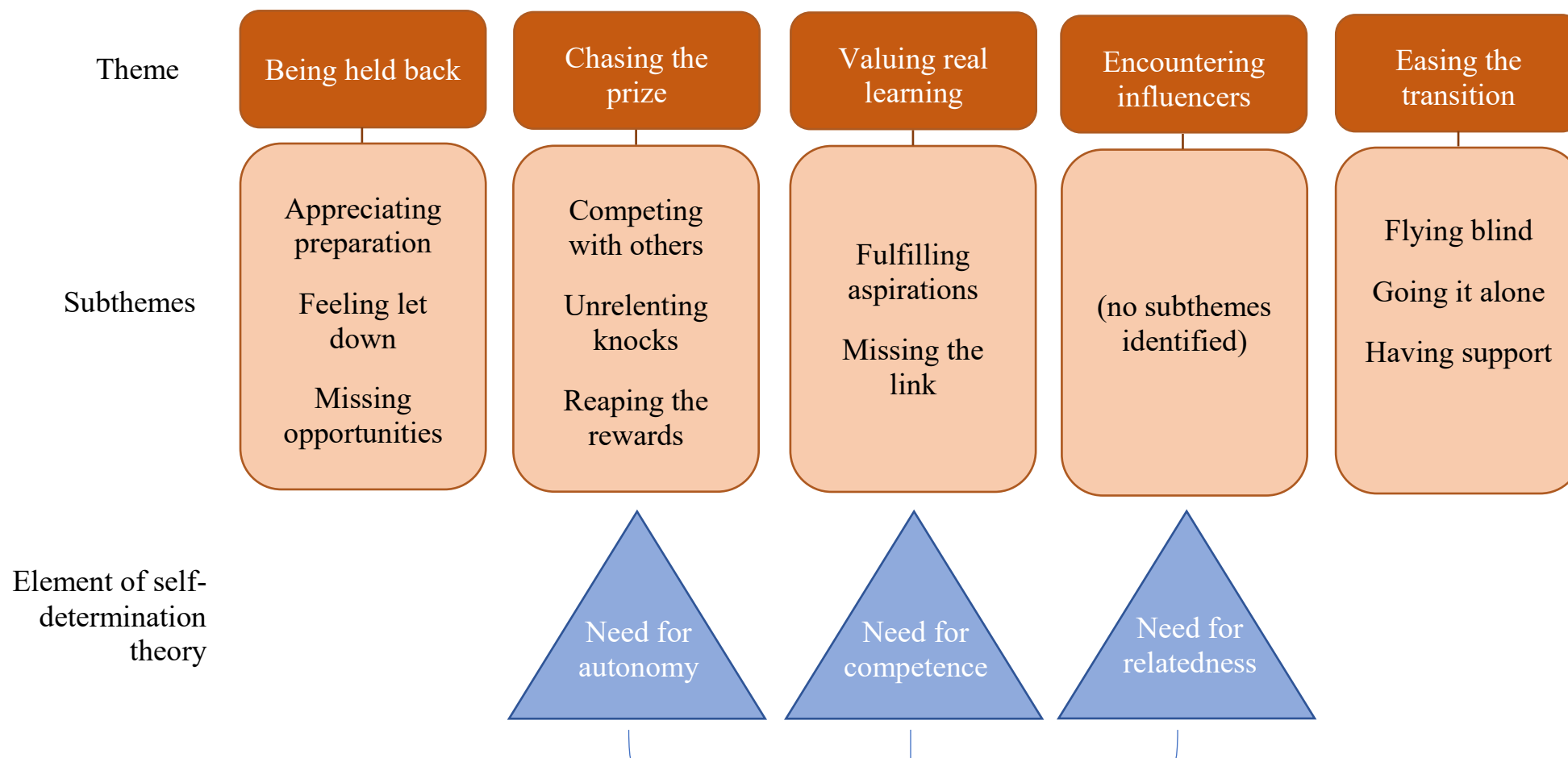
their employability, with activities such as work experience, volunteering and networking. It was also acknowledged by some participants that students who prioritised getting good grades over having additional dietetics-related experiences and who didn't act early in their degree to advance their professional development, were doing so to their detriment.

### **Valuing real learning**

Perspectives evident in the third theme related to how participants valued learning which was 'real'. As students they were empowered to fulfil their aspirations to become a dietitian through being able to actively 'do' rather than just having to passively 'listen'. A perceived lack of integration between theory and practice limited their motivation and professional development.

### **Fulfilling aspirations**

When participants engaged in practical, hands-on and experiential activities throughout their programs, they were able to realise their aspirations of being a dietitian. Those 'real-world' and 'real-life' exposures where students could implement the theory they had previously learned, were highly valued. This meant that placement was regarded as a highlight of their preparation by many participants. Similarly, practical activities in the university setting were also looked upon favourably by students in enhancing their preparedness for placement and future practice. Participants reported that while some activities (such as simulations and role plays) were not enjoyable at the time, they provided a valuable learning experience. There was also some variation around the utility of didactic activities such as lectures. Activities that were also seen as supplementary to the standard curriculum and that showcased the diversity of dietetics practice, were deemed as highly beneficial to students' professional development and desire to be a dietitian.



**Figure 7-1** Themes and subthemes identified from recent dietetics graduates' experiences of dietetics workforce preparation and preparedness



## Missing the link

Participants described a disconnect between the theory and practice elements of their degrees. Because of this, some struggled to understand the relevance of the content they were being taught early in their degrees. Others even reported feeling lost, disengaged and questioned their aspirations to become a dietitian. Often it wasn't until students had a placement or practice experience, which was usually towards the end of their degree, that the relevance of theory was realised. This impacted students' placement experience which was described as intense, overwhelming and a massive challenge. Participants recognised activities and assessment tasks that genuinely mirrored the work of dietitians in practice as beneficial, rather than being 'just for the sake of it.' Graduates reported that better and earlier integration of theory and practice could enhance the relevance of pedagogical activities and overall student experience.

## Encountering influencers

Within the fifth theme, there was a strong sense of acknowledgment for the integral role that certain people and events played in influencing future dietitians' careers. Connections provided valuable career currency for students and opened their eyes to the possibilities in dietetics careers.

Encounters with influential individuals were valued by graduates. Participants described how the engagement, encouragement and entrustment from placement supervisors solidified their aspirations and boosted their motivation. By contrast, placement settings with unwelcoming cultures and supervisors who were 'nasty' or disengaged created a negative learning environment which evoked frustration and despondence in students. Some graduates found lecturers inspiring and rated a lecturers' passion for their work as proportional to the utility of

the content being taught. Connections made with dietitians in practice and academia were linked with enhanced employability, resulting in a 'it's who you know' mentality for some participants. Hearing from 'real' dietitians in practice (e.g. guest speakers) brought life to the possible careers that emerging dietitians could pursue. Some encounters with people and placements were so influential, they prompted students to change their career preferences and to pursue another area of dietetics practice.

### **Easing the transition**

The fourth theme encapsulated graduates' experience of entering into the workforce after gaining their dietetics qualification. The transition from student to practitioner was imbued with a lack of guidance which left graduates feeling daunted and isolated. Those participants who felt well-supported by mentors' advice cherished this direction and support.

### **Flying blind**

Participants raised that they were not well prepared for and lacked guidance in entering the workforce. This left graduates feeling as though they were 'lost' and blindly trying to navigate the landscape of securing work as a dietitian. Those who did receive assistance with career development activities (e.g. preparing CVs, addressing selection criteria, answering interview questions) often felt it came too late in their programs or that it was focused on working in a narrow range of practice areas. They recognised that the process of becoming 'job ready' needed to start earlier and be embedded throughout degrees. There was variation within this subtheme as some participants reported they were well prepared by their university to secure work. These participants recalled benefitting from career development activities such as workshops facilitated by their universities and hearing guest presenters discuss job interview techniques.

### Going it alone

A lack of support while transitioning into the workforce as a graduate dietitian was apparent within this subtheme. This ‘lonely’ and ‘isolating’ experience impacted graduates’ trajectory into working life. While some cited the Dietitians Association of Australia (DAA) Accredited Practising Dietitian (APD) program as a means to assisting with their broader professional development, they felt there was nowhere to go if they had questions regarding day-to-day practice issues. The lack of support experienced was particularly evident for graduates entering into roles without dietitian colleagues or for graduates commencing work in emerging fields (e.g. private practice). Having a mentor through the formal DAA APD program was described by some as ‘invaluable.’ However, other participants reported shortcomings of this system, including that some mentors offered their services at a financial cost to graduates. Some participants described the profession as unsupportive of graduates and recognised the need for better networks to be established between graduates and universities, practitioners, mentors and the professional association.

### Having support

Being well supported was integral to graduates in their pursuit of work and adapting to life as a dietetics professional. Those graduates who were ‘lucky’ enough to benefit from having assistance cited mentors, peers, employers and dietitian colleagues in their workplace as making the process easier. Some participants felt well-supported by their university and rated educators as ‘excellent’ supporters, while others were vocal about being left to work things out for themselves as soon as they completed their degree. Some took steps to ensure that support was provided and established their own networks by joining groups and seeking out good mentors.

**Table 7-2** Characteristics of recent dietetics graduates (n=20) interviewed in this study

<i>Attribute</i>	<i>Number of participants</i>
Gender, n (%)	
Female	18 (90)
Male	2 (10)
Age, mean $\pm$ SD	30.2 $\pm$ 10.1
Current APD <sup>(a)</sup> status, n (%)	
Provisional APD	13 (65)
APD	7 (35)
State in which dietetics degree undertaken, n (%)	
Australian Capital Territory	2 (10)
New South Wales	3 (15)
Queensland	4 (20)
South Australia	3 (15)
Victoria	5 (25)
Western Australia	3 (15)
Current state/territory of residence/employment	
Australian Capital Territory	3 (15)
New South Wales	3 (15)
Northern Territory	1 (5)
Queensland	4 (20)
South Australia	1 (5)
Victoria	4 (20)
Western Australia	4 (20)
Level of dietetics degree completed	
Bachelor / Bachelor (Honours)	5 (25)
Masters	15 (75)
Duration of dietetics degree completed	
1.5 years	4 (20)
2.0 years	11 (55)
4.0 years	5 (25)
Months since completing dietetics degree, mean $\pm$ SD	10.2 $\pm$ 6.2
Current employment status as a dietitian	
Employed / working	18 (90)
Unemployed / seeking work	2 (10)
Current appointment status as a dietitian	
Full-time	13 (65)
Part-time	2 (10)
Casual	3 (15)
N/A	2 (10)
First appointment status as a dietitian	
Full-time	9 (45)
Part-time	4 (20)
Casual	5 (25)
N/A	2 (10)

**Table 7-2 (continued)**

Months taken to begin work/employment as a dietitian, mean $\pm$ SD	1.0 $\pm$ 1.3
Months taken to begin work/employment, n (%)	
0.0 – commenced work immediately after completing degree	7 (35)
≤1.0	5 (25)
1.1-2.0	3 (15)
2.1-3.0	2 (10)
3.1-4.0	1 (5)
N/A – not currently in paid work/employment as a dietitian	2 (10)
Months of experience working as a dietitian, mean $\pm$ SD	8.3 $\pm$ 6.9
Months of experience working as a dietitian, n (%)	
0.1-6.0	9 (45)
6.1-12.0	3 (15)
12.1-18.0	4 (20)
18-24	2 (10)
N/A – not currently working/employed as a dietitian	2 (10)
Total hours worked per week as a dietitian, mean $\pm$ SD	30.9 $\pm$ 14.0
Total hours (paid and unpaid) worked per week as a dietitian, n (%)	
0.0	1 (5)
0.1-16.0	3 (15)
16.1-32.0	4 (20)
32.1-40.0	9 (45)
>40	3 (15)
Total paid hours worked per week as a dietitian, mean $\pm$ SD	28.6 $\pm$ 16.0
Total paid hours worked per week as a dietitian, n (%)	
0.0	2 (10)
0.1-16.0	3 (15)
16.1-32.0	3 (15)
32.1-40.0	9 (45)
>40	3 (15)
Total unpaid hours worked per week as a dietitian, mean $\pm$ SD	2.6 $\pm$ 4.7
Total unpaid hours worked per week as a dietitian, n (%)	
0.0	12 (60)
0.1-4.0	4 (20)
4.1-8.0	2 (10)
8.1-12.0	2 (10)
>12.0	
Main area of practice since graduating	
Aged care	1 (5)
Clinical	4 (20)
Community	3 (15)
Food industry	1 (5)
Health promotion	1 (5)
Media & communications	1 (5)
Private practice	4 (20)
Research	3 (15)
N/A	2 (10)

(a) APD = Accredited Practising Dietitian

**Table 7-3** Illustrative quotes from dietetics graduates regarding their experience of workforce preparation and preparedness

Theme/subtheme	Participant quotations
1. Being held back	
1a. Appreciating preparation	<ul style="list-style-type: none"> <li>• “The course was fantastic. I wouldn’t want to talk it down but I do think it’s largely clinically focused, which for anybody who goes into a different field it’s a bit more difficult.” RG086</li> <li>• “I think the foundation that university provides is a solid foundation in terms of dietetic practice.” RG063</li> </ul>
1b. Feeling let down	<ul style="list-style-type: none"> <li>• “I felt (my preparation) was a bit brushed over very quickly. It was kind of just, how to get through placement, not how to finish uni and progress into the future...it was either being a hospital dietitian or nothing.” RG091</li> <li>• “Letting (students) know that it is quite difficult to get a job...we were never given that impression. We just thought we’d go out into the workforce, there’d be a job, and everything would be right.” RG068</li> </ul>
1c. Missing opportunities	<ul style="list-style-type: none"> <li>• “You’re taught as if you’re going to go and work in a hospital and that’s all they’re really taking care of for you. Whereas in reality, the majority don’t end up in that setting.” RG088</li> <li>• “We did a placement in food service and I don’t know anyone who has a job in food service, and I don’t know anyone that really wants one in that...maybe figuring out where the jobs are for the graduates, where the graduates are going and finding something that is more suited to that, to teach them.” RG082</li> </ul>

**Table 7-3 (continued)**

2. Chasing the prize	
2a. Competing with others	<ul style="list-style-type: none"> <li>• “The main challenge is there are too many graduates for the number of jobs...you’re competing with 100-plus people when you apply for a job and many of them have banked up from the year or two before you and...they have a bit more experience.” RG082</li> <li>• “There’s a lack of positions available for the amount of graduates there are...it’s hard, everybody has the same degree essentially and has done the same placements as required by DAA.” RG087</li> </ul> <p>Divergent:</p> <ul style="list-style-type: none"> <li>• “The majority of my peers do have work, whether it’s bits of work or full-time work...The idea was that it would be really hard, and it hasn’t been as hard as that.” RG075</li> </ul>
2b. Unrelenting knocks	<ul style="list-style-type: none"> <li>• “It’s a shame because you come out so enthusiastic, so ready to learn, and you’ve put all your efforts in to doing something...but you get knocked back...it’s very difficult.” RG087</li> <li>• “It’s so difficult to find work when you finish, it just destroys your motivation...I’ve moved to [city] to improve my chances, without knowing anyone, it’s very hard to know where to start. I don’t really know where to go, I know I need to get a foot inside the door, but...it’s really difficult and frustrating.” RG077</li> </ul>
2c. Reaping the rewards	<ul style="list-style-type: none"> <li>• “You need to set yourself apart from other people...a huge percentage of my cohort focused so hard on getting the best grades that they could...they’ve got amazing academic transcripts...but unfortunately when it’s so hard to get a job, it’s the people that have experience outside of uni that are going to stand out.” RG079</li> <li>• “I knew that networking was going to get me career ready but at the same time not studying for an exam as much as I should, because I was out talking to dietitians and networking, was a dilemma for me. I think most people chose one or the other.” RG067</li> </ul> <p>Divergent</p> <ul style="list-style-type: none"> <li>• “I did heaps of volunteering...all over the place, but I didn’t find that it actually helped me at all in getting a job.” RG062</li> </ul>

**Table 7-3** (continued)

3. Valuing real learning	
3a. Fulfilling aspirations	<ul style="list-style-type: none"> <li>• “The assessments were really good because they were all things that dietitians would do in the workforce. They weren’t just for the sake of an assessment task...I can see now that a lot of the assessments we did were very much things that dietitians are paid to do in the real world...that's really important.” RG088</li> <li>• “Placement was obviously the highlight...because I was interacting with patients and putting the theory into practice and not just sitting down, listening to someone to talk...that’s when things ‘stuck’...it’s a bit better than sitting in a lecture” RG082</li> <li>• “I got a lot of practical experiences at [university]...they’ve got a high-tech clinic where clients come in for a free consult and you are supervised...I found that once I was on prac in the hospital or in the community that I already had that client-based experience...that was a really good experience.” RG069</li> </ul>
3b. Missing the link	<ul style="list-style-type: none"> <li>• “The first three years...just to say, ‘Well, here's the theory. You'll get the practical experience in your final year.’ How can we join the relevance in that? That was a massive challenge for us...I found a lot of people in fourth year were going, ‘Oh, I didn’t realise that's what dietitians did.’ It's logical that you apply theory as you practice, as you learn it, rather than two years later.” RG072</li> <li>• “The first two years were definitely at times a struggle to see their link to nutrition...it seems like it wasn’t 100% related to being a dietitian...I was kind of thinking, ‘Oh, maybe this isn’t for me.’ But then in third year, when we started doing more practical things...I was really glad that I stuck with it...when I was able to see...those things in action...that was a real confidence boost to me, ‘Yes, I will enjoy doing this,’ because I did get a little bit lost for a while there.” RG080</li> </ul>



**Table 7-3 (continued)**

4. Easing the transition	
4a. Flying blind	<ul style="list-style-type: none"> <li>• “(Preparation to) write CV’s and cover letters...we had one hour on this. With the difficulties of getting work now, that’s something that was missing, career help in general, all the practical tips. A lot of the questions I have right now, I wish that our lecturers would have discussed that with us during hours at uni.” RG077</li> <li>• “The transition from being a student to an employee...we don’t really know sometimes if we’re doing the right thing...we get so much feedback as a student...whereas, once you start working you’re just on your own for most of the time” RG082</li> </ul> <p>Divergent:</p> <ul style="list-style-type: none"> <li>• “I was very fortunate...I feel like our course did prepare us very well for, actually applying for jobs and where you look and how you put together a resume and how you put together a cover letter...the careers centre was really great” RG094</li> </ul>
4b. Going it alone	<ul style="list-style-type: none"> <li>• “A lot of new graduates are going into private practice and when you ask for help through the (discussion) boards, a lot of them become quite narky and don’t wanna support new graduates... you have questions and you want support...that doesn’t happen....it’s really hard to find mentors and a lot of them charge a lot of money...support for new grads is zero...the amount to pay for membership (of the professional association) is so huge as a part-time worker...I get nothing from them...it’s really disappointing.” RG091</li> <li>• “In a hospital, you probably get a lot more interaction and you probably feel more engaged with dietetics because you could discuss things with people on your lunch break...but for private practitioners, we’re on our own, we’ve got no one to talk to.” RG071</li> <li>• “I just feel very disconnected from everyone. I know that I’m a new grad...but most days, I’m on my own...you feel pretty isolated from what’s going on.” RG072</li> </ul>

**Table 7-3** (continued)

4c. Having support	<ul style="list-style-type: none"> <li>• “My (placement supervisor) doubled as a mentor through my provisional period...it wasn’t stressful at all, at first it was a bit overwhelming...because I had high expectations on myself, but I had a lot of good support.” RG069</li> <li>• “That initial process (of looking for work) was very stressful, but what I did really value was the university’s career service who have a ‘call us as many times as you like for feedback’ policy, so that was really good...I certainly think that helps.” RG080</li> </ul>
5. Encountering influencers	
(no subthemes identified)	<ul style="list-style-type: none"> <li>• “Meeting dietitians in the profession that became mentors and I really admired, that probably formed the path that I have taken...where I’m working in now...(I) really enjoyed the relationships that I formed with people throughout the course...we had some really inspiring lecturers that were doing interesting things in the field...that was really encouraging thinking ahead in my career.” RG079</li> <li>• “There were some supervisors who weren’t interested in being there at all...they tended to be more harsh and abrasive and sometimes a bit nasty...that doesn’t make a particularly good environment for learning. But at one of my placements, they understood that by that stage, you can feel a bit beaten down...they were very positive and very reassuring, and that was definitely something that helped to promote my learning because...a little bit of positive feedback goes a long way when you feel that way.” RG068</li> <li>• “My very first placement in clinical...I loved it...I was treated as if I was one of their colleagues rather than a student for most of the time...it was really fantastic, the people that were there and also getting exposure to the area that I really wanted exposure to.” RG088</li> </ul>

## 7.6. Discussion

This is the first study to take a national approach to exploring recent dietetics graduates' broad experiences of being prepared as a dietitian in Australia. The five themes identified were: 1) being held back; 2) chasing the prize; 3) valuing real learning; 4) easing the transition; and 5) encountering influencers. While graduates reflected positively on their preparation, they were not empowered or equipped to embrace opportunities in diverse and emerging areas of practice. Graduates were challenged by the competitive landscape of securing obvious job opportunities and by a lack of support in entering and acclimatizing to the workforce. Exposures to practice settings and encounters with influential dietitians enabled the fulfillment of graduates' dietetics aspirations and were highly valued.

Producing graduates who are underprepared to embrace a range of existing and emerging opportunities is of concern. An overemphasis on preparing graduates for traditional areas (e.g. clinical dietetics) as described by the participants in this study reflects the views of other key stakeholders in dietetics workforce preparation (i.e. practice educators, students).<sup>39,55</sup> These findings are incongruent with the professional association's intention to "prepare competent graduate dietitians through a 'generalist' education...to capitalise on the variety of opportunities that now exist in the Australian food and nutrition industry".<sup>8</sup> They also strengthen the 'underprepared' and 'overproduced' scenario previously hypothesised by leaders in the profession, whereby dietetics education programs produce too many graduates with too few skills relevant to future workforce needs.<sup>56</sup> To ensure that tomorrow's dietitians are equipped to embrace an array of opportunities, dietetics education programs, and the accreditation standards that underpin them, must reflect contemporary practice. Considerable leadership has been shown in the UK and USA where research has been commissioned to envision the future direction of the dietetics profession.<sup>9,10,57</sup> Conducting similar research in

Australia to ensure that dietitians, and the programs preparing them, are responsive and relevant would benefit both the existing and emerging dietetics workforce.

Participants' disenchantment at having to fiercely compete for employment significantly impacted their experience of entering the workforce. Despite the participant characteristics indicating that most of these graduates secured some form of work quite quickly, their insights revealed this experience could be much improved. Even those who were successful in securing work easily recognised that they were 'lucky'. While data on dietetics graduate outcomes in Australia is lacking,<sup>58</sup> this strong competition for obvious job opportunities as a result of a perceived graduate oversupply has been confirmed by dietetics educators in both academic and practice settings.<sup>38,39</sup> These findings support the need to address the competitive landscape resulting from supply/demand mismatches that exist within dietetics internationally.<sup>55,59,60</sup> Providing students with experiences across diverse practice contexts to illustrate the breadth of possible careers is one potential strategy. An established body of evidence regarding role-emerging placements, which can promote a profession's expansion into new areas and serve as a precursor to graduate employment,<sup>61,62</sup> exists for occupational therapy.<sup>63</sup> These placements have been trialled in dietetics.<sup>64</sup> However, significantly more research to support educators to implement student placements in emerging dietetics settings is needed.

It is well-recognised that the transition from student to health professional can be challenging.<sup>65,66</sup> For the graduates in this study, a lack of support and guidance throughout this pivotal process resulted in a sense of trepidation, isolation and conjecture. This sentiment was notably pronounced for graduates entering, or attempting to enter, sole practitioner roles (e.g. private practice). While there is no published data to enumerate dietetics graduates embarking on careers in private practice in Australia, this apparent growth of unsupported and underprepared newly graduated dietitians is considered a 'risk' to the profession.<sup>39</sup>

Existing mechanisms for supporting novice dietitians in Australia (e.g. a formal mentoring program,<sup>67</sup> an interest group,<sup>68</sup> webinars<sup>69</sup> and coaching sessions<sup>70</sup>), often come at a financial cost and are not always known to, or actioned by, graduates until the conclusion of university. It remains to be seen if the DAA memberships, now available at no cost to student dietitians from the commencement of their university program, will contribute to their preparation and preparedness. Further, there remains an obvious gap for dietetics educators to more astutely assist dietetics graduates to search for, secure and adjust to work earlier in their preparation.

Encouraging students to engage in both formal and informal interactions throughout university can lead to enhanced and collaborative learning.<sup>71</sup> Adopting such a strategy in dietetics could result in graduates who, as a group, support each other, address common issues and share resources throughout their transition into the workforce. In addition, this could strengthen ties between students/graduates while reducing competition and enhancing collaboration among emerging dietitians. Moreover, exposing students to potential mentors (either from dietetics or other related fields e.g. business) and empowering them to initiate mentoring relationships from the commencement of their degrees could ease the student-to-professional transition. All stakeholders, including the university, the professional association and the students/graduates themselves, have a responsibility to ensure that preparedness starts from program commencement and continues beyond graduation.

The fulfillment that graduates in this study derived from authentic exposures validates the andragogical value of active learning. However, participants' recognition of theory and practice as separate entities which were not well-integrated may highlight deficiencies in dietetics education in Australia. Further, graduates' propensity to reflect on their preparation as occurring in siloes or discrete domains (e.g. clinical dietetics, community and public health nutrition, and food service) is also noteworthy. These findings allude to the possibility that dietetics is yet to fully embrace evidence generated from contemporary health professional

education research regarding holistic approaches to preparation. For example, taking programmatic and systems-based approaches to assessment and curriculum design.<sup>72-74</sup> It also reaffirms the notion that dietetics graduates are not true generalists. Given the recognised need for health professionals who can adapt to our ever-changing health care landscape, producing competent generalists who are empowered to create opportunities regardless of the context in which they work has been proposed as one solution.<sup>75</sup> Stakeholders in dietetics education must ensure that dietetics education programs are holistic in nature, with theory and practice effectively integrated and embedded to expedite the performance of students and therefore graduates.

The findings of this study strengthen and reiterate the case for the collection and dissemination of up-to-date data on the dietetics workforce in Australia. Dietetics does not benefit from the consistent and coordinated workforce data collection services provided to other registered professions by the Australian Health Practitioner Regulation Agency.<sup>14</sup> Further, the professional dietetics association does not publish information on the characteristics of the workforce that it represents, including that of dietetics students and graduates. The last time that graduate outcomes for a national sample of recently graduated dietitians was reported in Australia was over 25 years ago.<sup>76</sup> As a result of this evidence gap, it is impossible to assess if samples such as the one in this study are representative of the population of recent graduates. Dietetics stakeholders, such as researchers and educators, are also unable to analyse how the workforce is evolving and to adapt dietetics education curricula accordingly. This significantly limits the profession's ability to progress. Robust and regularly collected dietetics workforce data in Australia is urgently needed.

Viewing the results of this study through the lens of self-determination theory<sup>46,47</sup> can help to understand the meaning that participants attributed to their experiences of dietetics workforce preparation and preparedness. In accordance with this theory, an individual's

motivation to learn, seek out challenges and optimally function, depends on the satisfaction of three innate needs – autonomy, competence and relatedness. Situations that thwart the satisfaction of these needs result in reduced motivation for individuals. Graduates demonstrated their need for autonomy (desire to control one's own destiny) through their sentiments of disenchantment at difficulties experienced while trying to enter the workforce. Their need for competence (desire to be effective in activities pursued) was evident in their fulfillment from being able to participate in 'real' learning experiences in practice settings. The satisfaction that participants expressed around their encounters with influential dietitians was indicative of their need for relatedness (desire for belonging and connectedness with significant others). A greater understanding of students' and graduates' self-determined motivations can assist dietetics education stakeholders to develop contexts that support their desires for achieving optimal growth.

#### **7.6.1. Strengths and limitations**

A key strength of this study was the diversity of participant characteristics. The national sample of graduates from a range of locations across the country enhances transferability of the study's findings to other contexts. Participants were ideally-placed to reflect on their experience as a student, while also having the context of being (or attempting to be) a dietitian in the workforce. The multianalyst approach to code checking, transcript auditing and development of themes promoted interpretive validity<sup>77</sup> and helped to ensure rigour in determining when the research question had been addressed.<sup>54</sup> Reflexivity<sup>40</sup> was enhanced through multiple, robust discussions during data analysis and by all researchers acknowledging their positions in relation to the research topic. Interviews were conducted in a uniform manner and by a researcher unknown to the participants to ensure descriptive validity<sup>77</sup> while open-ended questions minimised researcher influence on participant

responses. The use of template analysis in the development of themes<sup>53</sup> helped to account for any influence from similar studies conducted by the research team.

While sampling methods attempted to limit self-selection bias, the self-nominating participants could have been more motivated to share memorable (i.e. very good or very bad) experiences of their education. This may limit the transferability of this study's findings to other contexts as these experiences may or may not be shared by other dietetics graduates. Another potential limitation pertains to the revised competency and accreditation standards for dietetics education programs in Australia which were being phased in at the time of this study. Ongoing research may illustrate if and how these updated standards have since impacted dietetics graduates' experiences of their preparation. The sample size used here is consistent with accepted qualitative research methods aimed at obtaining richly detailed descriptions from individuals about a phenomenon of interest and is not considered a limitation.

#### **7.6.2. Implications for future practice and research**

This study's findings have implications for stakeholders involved in health workforce preparation – both dietetics and other disciplines. Recent graduates are well-placed informants to comment on their preparation and preparedness for practice, yet few studies have taken a national approach to gain in-depth insights of these phenomena. This study provides impetus for educators and researchers in other countries, and in other health professions, to broadly explore how emerging practitioners view their training and work-readiness. A robust analysis of the current and future state of the existing and emerging dietetics workforce in Australia is urgently needed. Further, assessing the viability of role-emerging student placements in health professions witnessing role expansion, such as dietetics, is also warranted. Dietetics may also benefit from adopting strategies shown to be



effective in other health professions that support, mentor and enhance graduates' transition into the workforce. Finally, future research that focuses on potential solutions which may address the challenges raised by the participants in this study will only serve to benefit the rapidly growing and potentially-impactful dietetics profession. Addressing these suggestions could help to inform curricula and produce graduates that are responsive and relevant to future health and health workforce needs.

### **7.6.3. Conclusions**

Recent dietetics graduates provide important insights on an emerging and evolving workforce that is well-placed to advance global health. While they are fulfilled by experiential professional activities and encounters with influential dietitians, dietetics graduates feel disenchanted by being prepared for a narrow range of practice areas and by a lack of workforce transition guidance. To ensure that the emerging dietetics workforce is responsive and relevant to future workforce and health needs, dietetics education programs and the standards that underpin them must consider graduates' perspectives on their preparation and respond accordingly. Research on role-emerging dietetics placements along with enhanced support mechanisms for novice dietitians and robust dietetics workforce data is urgently required to ensure that future dietetics preparation and practice are appropriately aligned.

### **7.7. Disclosures**

The authors declare that they have no conflict of interests.

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## **Chapter 8. Qualitative Synthesis of Dietetics Students' Experiences**

## 8.1. Preface

This chapter provides a systematic review and qualitative synthesis of the existing literature regarding students' experiences of dietetics workforce preparation and preparedness. As key stakeholders in dietetics education and emerging practitioners, dietetics students are well-placed to provide insights into the phenomena of interest.

Immersion in the literature revealed that a systematic synthesis of students' experiences of dietetics workforce preparation and preparedness had not previously been conducted. It also revealed that while dietetics students' perspectives have previously been sought, it was often in regards to a single aspect of their preparation (e.g. participation in a clinic). Further, it was apparent that research regarding students' overall experience of their education was lacking. Therefore, this review was not limited to the experiences of students based only in Australia.

Systematic reviews typically aim to synthesise findings regarding the effectiveness of interventions while qualitative research can be used to understand and interpret the meanings behind individuals' experiences. Systematic reviews of qualitative research (i.e. qualitative syntheses), however, can synthesise and 'go beyond' the findings of primary studies to address a question not previously answered by those studies. A qualitative synthesis of dietetics students' experiences of their education was therefore necessary.

This chapter contains the accepted version of an original manuscript published in a peer-reviewed journal. The formatting of this manuscript is consistent with the thesis style (e.g. spelling of the word program has been amended to reflect Australian English). References for this manuscript appear at the end of the chapter and supplementary tables and figures appear in the appendices at the end of the thesis.

Citation: **Morgan, K,** Campbell, KL, Reidlinger, DP. Dietetics students' experiences of dietetics workforce preparation and preparedness: a systematic review and qualitative synthesis. *Journal of Human Nutrition and Dietetics* 2018, 32: 226-246. <https://doi.org/10.1111/jhn.12600>

## **8.2. Abstract**

### **8.2.1. Background**

Dietetics students are a widely researched group. As emerging dietitians, they can provide valuable insights to inform how dietetics education programs may be enhanced to meet contemporary healthcare needs. This review aimed to systematically synthesise dietetics students' experiences of dietetics workforce preparation.

### **8.2.2. Methods**

MEDLINE, CINAHL, Embase, PsycINFO, ERIC, Informit and ProQuest Dissertations and Theses Global were searched to identify research published until June 2017. Studies investigating dietetics students' experiences of dietetics workforce preparation, and employing qualitative data collection and analysis methods were included. Data analysis was guided by thematic synthesis, where themes were constructed through an iterative and inductive process. Study quality was appraised using the RATS Qualitative Research Review Guidelines.

### **8.2.3. Results**

From the 3301 records identified, five studies met the inclusion criteria and the views of 120 dietetics students from two countries over a 9-year period were synthesised. The overarching theme of 'navigating through the ups and downs' was underpinned by four main themes:

enduring hurdles; reconciling expectations; transforming self; and making and breaking connections. Quality appraisal results rated selection bias as being inadequate/ inappropriate across all studies.

#### **8.2.4. Conclusions**

Dietetics students undertake a transformational journey through dietetics education. They are inspired by seeing what is possible through meaningful encounters with practitioners in diverse settings. However, they are challenged by competitive environments and perceived ideals that are embedded in the profession. Strategies that focus on exposing dietetics students to inspirational practitioners, increasing and celebrating diversity in academic/placement settings, and incentivising collaboration across dietetics education, could act as catalysts to enhance the experience of future dietetics students and the nutrition-related health of those they will serve.

#### **8.2.5. Keywords**

Dietetics, dietetics education, qualitative, students, systematic review, workforce.

### **8.3. Introduction**

Effectively preparing future health professionals for the workforce is critical to advancing the health of the population.<sup>1,2</sup> As the double burden of malnutrition continues<sup>3</sup> and the nutritional health of populations worsens,<sup>4-6</sup> the emerging dietetics workforce has a potentially pivotal role to play in addressing these challenges. Dietetics students represent the future workforce. The extent to which this next generation of nutrition care providers are being prepared for contemporary practice has been reported by dietetics program directors.<sup>7</sup>

However, dietetics students' perspectives on how they are being prepared for practice are essential to informing and enhancing the development of future dietitians.

Dietetics workforce preparation (also referred to as dietetics education) involves the formal process of equipping individuals with attributes required to perform the role of a dietitian.<sup>8</sup> Guided by national accreditation bodies and competency standards,<sup>9-13</sup> dietetics education programs aim to produce entry-level dietitians who are competent or 'fit' for practice. This is typically achieved through a range of activities which take place in universities and during internships/practical placements (herein referred to collectively as placements). Globally, more than 45,000 students are completing professional dietetics qualifications each year.<sup>14</sup> However, emerging practitioners are facing challenges such as placement funding cuts<sup>15</sup> and shortages<sup>16</sup> and limited employment prospects upon graduation.<sup>15,17</sup> Dietetics graduates are also entering increasingly diverse and dynamic practice landscapes.<sup>18,19</sup> Moreover, the marketisation of university degrees which has seen students adopt a 'consumer' identity and hold inflated expectations of higher education institutions,<sup>20-22</sup> means that students' views on their preparation will have implications for all stakeholders involved. Investigating students' experiences of their preparation may help to illuminate the impact of such experiences on these developing health professionals.

While qualitative research can be used to understand and interpret the meanings behind individuals' experiences of a phenomenon of interest<sup>23</sup>, systematic reviews of qualitative research, also called qualitative syntheses, can synthesise and 'go beyond' the findings of primary studies to address a question not previously answered by those studies.<sup>24-26</sup> Individuals' experiences of an aspect of health workforce preparation have been synthesised in nursing,<sup>27-29</sup> physiotherapy<sup>30,31</sup> and medicine.<sup>32</sup> These qualitative syntheses provide valuable insights into how curricula and student preparation may be enhanced to



meet contemporary health care needs in these professions. Dietetics students' perspectives on their experiences of being prepared for the workforce are less clear.

Dietetics students are well-placed to share their insights into the phenomenon of workforce preparation and are a widely researched group. A recent review of research in dietetics workforce preparation found that students were the most frequently studied of all participant groups.<sup>33</sup> However, much of the research to date has taken a piecemeal approach and focused on single, selected aspects of student's educational experiences. For example, assessment,<sup>34</sup> simulation,<sup>35,36</sup> problem-based learning,<sup>37</sup> interprofessional learning,<sup>38,39</sup> clinical activities,<sup>40-42</sup> volunteering,<sup>43</sup> research,<sup>44,45</sup> and reflective practice.<sup>46,47</sup> Despite this body of evidence, the experiences of dietetics students regarding their education and preparation for the workforce have not been systematically synthesised.

Providing dietetics students with experiences that optimise their preparedness for practice may enhance their effectiveness as practitioners and the nutrition-related health of the individuals and populations they serve. Taking a broad view to explore students' overall experience of their education can be useful to inform future dietetics workforce preparation. Uncovering such intelligence from students' experiences will be key to informing dietetics education curricula enhancement and therefore, the preparation of future dietitians. This systematic review of qualitative studies aimed to synthesise dietetics students' experiences of dietetics workforce preparation.

## **8.4. Materials and methods**

A systematic review and synthesis of qualitative studies was undertaken. The protocol for this review was registered with the International Prospective Register of Systematic Reviews (PROSPERO) (registration ID CRD42017072750). Ethical approval was not required and

reporting was guided by the Enhancing Transparency in Reporting the Synthesis of Qualitative Research (ENTREQ) framework (Table S8-1).<sup>48</sup>

#### **8.4.1. Search strategy**

A comprehensive search to identify all available studies was performed in June 2017. The electronic databases MEDLINE (Ovid), CINAHL, Embase (Ovid), PsycINFO, ERIC, Informit and ProQuest Dissertation & Theses Global were searched with the assistance of an experienced health librarian. Search terms were used in combination with validated, database-specific filters for retrieving qualitative studies<sup>49-54</sup> and were modified with database-specific subject headings where appropriate (e.g. MeSH terms in MEDLINE) (Table S8-2). The search was not limited by dates, languages or settings. Reference lists of included studies and key journals publishing dietetics education research (Table S8-3) were manually searched from July to December 2017 to identify additional eligible studies.

#### **8.4.2. Eligibility criteria**

Original research studies were eligible for inclusion if they investigated dietetics students' experiences of dietetics workforce preparation and/or preparedness prior to entering the workforce. The phenomenon of interest being investigated had to be broad (e.g. experience of entire dietetics education or all placements) and eligible studies had to employ qualitative methods in both data collection (e.g. interviews, focus groups) and data analysis (e.g. thematic analysis). Studies were excluded if they: reported dietetics students' experiences in combination with other health professional students' (e.g. dietetics and nursing students); investigated only one activity or aspect of students' experiences (e.g. participation in a clinic or a community placement); did not employ both qualitative data collection and analysis methods (e.g. a survey with open-ended questions); or were not primary, full research papers (e.g. conference abstracts). These methodological parameters were set to ensure that studies

with homogenous designs offering richly detailed, in-depth insights from participants were included and synthesised, as opposed to studies which may have only offered a surface understanding of human experience.<sup>55</sup>

#### **8.4.3. Study selection**

Citations identified from the search process were imported into referencing management software EndNote version X8.2<sup>56</sup> and duplicates were removed. The primary researcher (KM) screened all records by title and abstract against the pre-determined inclusion criteria. To enhance reliability in the screening process and to ensure that only relevant studies were included in accordance with the eligibility criteria, a 10% subset of citations were independently screened by a second researcher (KC)<sup>57</sup>. A 100% level of agreement between researchers was reached at this stage. Therefore, further cross-checking of citations by a second researcher and the involvement of a third researcher (DR) was not required. The eligibility of retrieved full-text articles was independently assessed by all researchers (KM, KC & DR) with consensus on the final studies to be included reached through discussion.

#### **8.4.4. Data extraction**

Data were extracted from included studies (KM) using a standardised form to capture key characteristics of each study (author, year, title, country, participants, phenomenon of interest, context/setting, study design, outcomes).<sup>58</sup> All text labelled as ‘results’ or ‘findings’ in the abstracts and full papers, including quotes and tables, were extracted<sup>24</sup> and imported into NVivo version 11<sup>59</sup> for subsequent analysis. Prior to the commencement of data analysis, all extracted data in the standardised form and the NVivo file was independently cross-checked (DR) with disagreements between researchers regarding extracted data resolved via discussion (KM & DR).

#### **8.4.5. Data analysis**

Data analysis and synthesis was guided by thematic synthesis, as described by Thomas and Harden<sup>24</sup>, whereby prominent and recurrent themes are systematically identified from the combined findings of multiple qualitative studies.<sup>60</sup> Two researchers (KM & DR) read each study multiple times to develop familiarity with the data<sup>61</sup> and then independently performed line-by-line coding of each study's findings, which involved reviewing each line of text and assigning a code or label to each piece of data deemed of interest and relevant to addressing the review's aim.<sup>61,62</sup> Following coding of the first study's findings, the data from each subsequent study was either assigned into a pre-existing code or new codes were developed where novel concepts were identified.<sup>24</sup> Analysis was inductive (aimed at generating explanations from the data)<sup>62</sup> and followed an iterative process (researchers met multiple times to refine themes).<sup>63</sup> Codes were grouped into related categories to facilitate the development of descriptive themes – themes which remained close to the original study's findings. To address this review's aim, researchers engaged in further discussion and analysis which enabled a new interpretation of the data and generated analytic themes (and subthemes) which went beyond the content of the included studies (Figure S8-1). This notion of not simply re-stating individual study's findings but developing a novel interpretation of the combined study's findings acknowledges that the sum is greater than the parts and is aimed at specifically addressing the research question.<sup>24,55</sup> Exemplar participant and author quotations were selected from the included studies to illustrate the themes and subthemes constructed by researchers. Field notes were kept throughout the process to enhance reflexivity whereby researchers acknowledged their role in the research process and their influence in constructing the research findings.<sup>64</sup>

#### **8.4.6. Quality appraisal**

Given the qualitative approaches taken in the included studies, the RATS Qualitative Research Review Guidelines<sup>65</sup> were selected as appropriate for conducting quality appraisal of individual studies. Two researchers (KM & DR) independently and systematically appraised the quality of each included study according to relevance, appropriateness, transparency and soundness of the study and its findings. Disagreements between researchers on quality ratings were resolved through discussion. Articles were not scored or graded, nor were any articles excluded from the synthesis due to the lack of consensus on a validated and reliable method for assigning a numerical score and/or excluding qualitative studies from systematic reviews.<sup>60,66,67</sup> Aspects of each study were assessed as being either adequate/appropriate or inadequate/inappropriate against each of 22 criteria included in the RATS guidelines.<sup>65</sup>

### **8.5. Results**

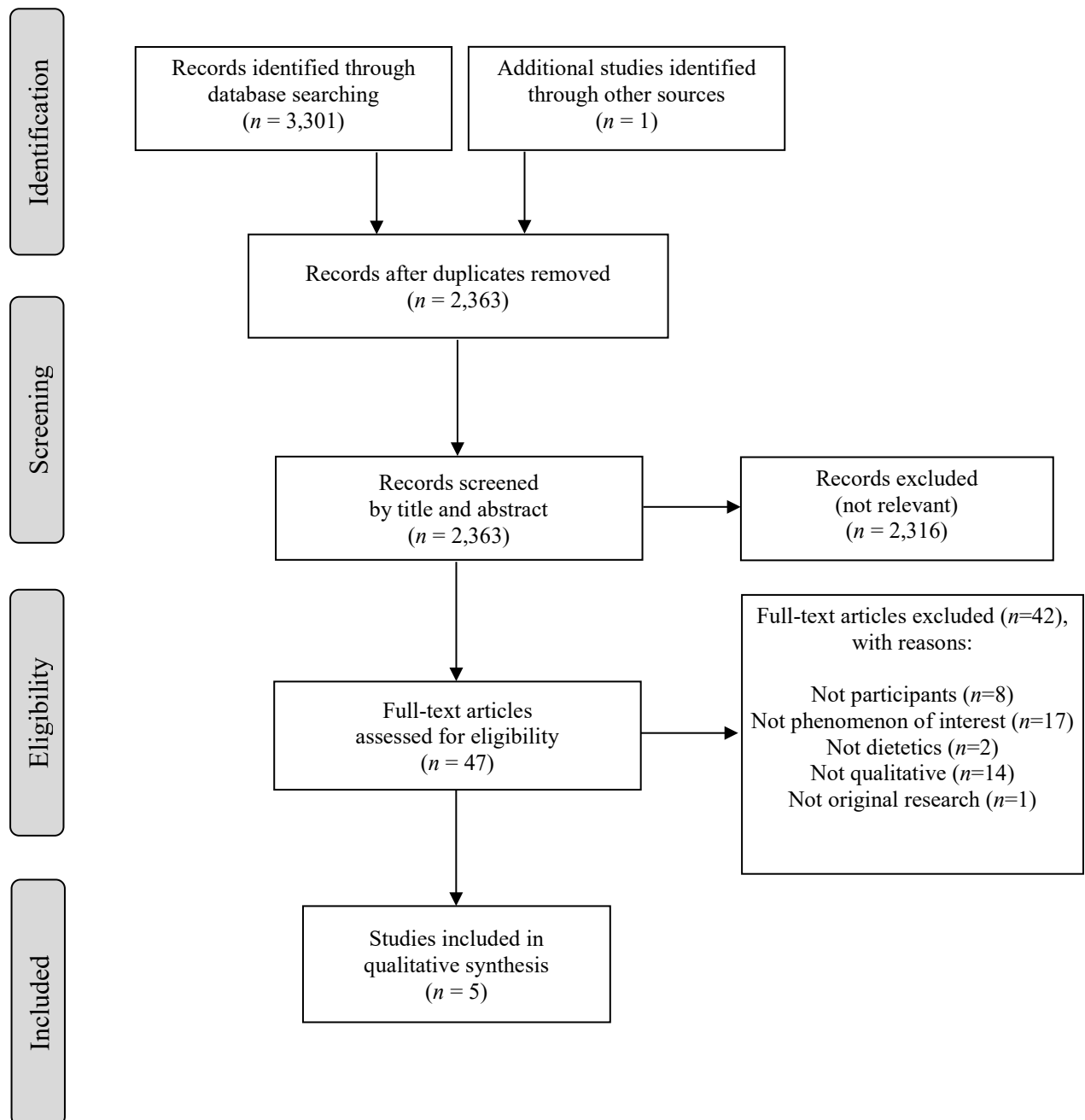
#### **8.5.1. Study characteristics**

From the initial search which identified 3,301 records, a total of five articles reporting four separate studies met the inclusion criteria and were included in this review (Figure 8-1).

Characteristics of the studies included in this review are summarised in Table 8-1.<sup>68-72</sup>

Publication years ranged from 2009-2017 with three studies being conducted in Canada and two in Australia. No eligible studies were identified from the United Kingdom or the United States. A total of 120 students in the university setting described their experiences of their education (two studies explored different aspects of students' experiences from the same sample). Most studies (3/5) were guided by a phenomenological approach and undergraduate (Bachelor's level) students were the most commonly sampled participant group. Interviews

were the predominant enquiry method (3/5) and most studies (4/5) reported the use of thematic analysis.



**Figure 8-1** Preferred Reporting Items for Systematic Reviews flow chart of a systematic review of studies regarding students' experiences of dietetics workforce preparation and preparedness

**Table 8-1** Summary of studies exploring dietetics students' experiences of dietetics workforce preparation and/or preparedness

Author(s)	Year	Country	Participants	Phenomenon of interest	Context/setting	Design			Outcomes
						Approach	Enquiry	Analysis	
Atkins and Gingras <sup>68</sup>	2009	Canada	Undergraduate students in their first year or their final year of program (n=14)	Students' experience of their identity, their education, and their preparation for practice	University	Phenomenological	Interviews	Thematic	Experiences
Lordly and MacLellan <sup>69</sup>	2012	Canada	Undergraduate students in their final two years of their program (n=13)	Students' identity development and professional socialization during dietetics education	University	Phenomenological	Interviews	Thematic	Experiences
MacLellan and Lordly <sup>70</sup>	2013	Canada	Undergraduate students in their final two years of their program (n=13)	Students' beliefs about what becoming a dietitian means	University	Phenomenological	Interviews	Thematic	Beliefs
McCall and colleagues <sup>71</sup>	2009	Australia	Undergraduate students in their final two years of their program who had recently completed their first seven week or final eight-week placement (n=12)	Students' experience of placements and their impact on attitudes towards a future career in dietetics	University	Qualitative description	Focus groups	Content	Experiences
Palermo and colleagues <sup>72</sup>	2017	Australia	Students who had completed required coursework and were ready to graduate from either a Bachelor or Masters level program (n=81)	Students' perception professional competence and the role of assessment in developing competence	University	Qualitative description	Focus groups	Thematic	Experiences and perspectives

**Table 8-2** Quality appraisal of included studies regarding students' experiences of being prepared as a dietitian

Guideline <sup>a</sup>		Primary author, year				
		Atkins 2009 <sup>(68)</sup>	Lordly 2012 <sup>(69)</sup>	MacLellan 2013 <sup>(70)b</sup>	McCall 2009 <sup>(71)</sup>	Palermo 2017 <sup>(72)</sup>
<b>Relevance of question</b>	1. Question stated	✓	✓	✓	✓	✓
	2. Question relevant	✓	✓	✓	✓	✓
<b>Appropriateness of method</b>	3. Method appropriate	✓	✓	✓	✓	✓
	4. Sampling appropriate	✓	✗	✗	✓	✓
<b>Transparency of procedures</b>	5. Recruitment appropriate	✓	✓	✓	✗	✓
	6. Selection bias present	✗	✗	✗	✗	✗
	7. Data collection comprehensive	✓	✓	✓	✓	✗
	8. Study group & setting described	✗	✓	✓	✓	✓
	9. End of data collection justified	✗	✗	✗	✗	✓
	10. Researcher role/s appropriate	✓	✓	✓	✓	✗
	11. Researcher influence described	✓	✓	✓	✓	✓
	12. Informed consent described	✗	✗	✗	✗	✓
	13. Anonymity & confidentiality discussed	✓	✗	✓	✓	✗
	14. Ethical approval cited	✓	✓	✓	✓	✓
	15. Analytic approach described	✓	✓	✓	✗	✓
	16. Interpretations presented & supported	✗	✓	✓	✓	✓
	17. Quotes appropriate & effective	✗	✓	✗	✓	✗
	18. Trustworthiness described & justified	✗	✓	✓	✓	✓
<b>Soundness of approach</b>	19. Findings grounded in literature	✓	✓	✓	✓	✓
	20. Strengths & limitations described	✗	✗	✗	✓	✗
	21. Manuscript well written	✓	✓	✓	✓	✓
	22. Presence of red flags	✗	✗	✗	✗	✗

✓ = adequate or appropriate; ✗ = inadequate or inappropriate

<sup>a</sup> Abbreviated version of each of the 22 RATS qualitative research review guidelines <sup>(65)</sup> is provided

<sup>b</sup>Lordly and MacLellan are two papers from the same study. Lordly is the primary paper with the MacLellan paper stating 'A detailed description of the methods has been published previously.' Where appropriate, methods have been appraised for MacLellan as per Lordly.



### 8.5.2. Study quality

Appraisal revealed variable quality of included studies when assessed against RATS criteria<sup>65</sup> (Table 8-2). Both relevance of the study question and appropriateness of the qualitative method were appraised as adequate/appropriate for all included studies. However, certain aspects regarding transparency of procedures and soundness of interpretive approach were deemed inadequate/inappropriate against RATS guidelines. Specifically, presence of selection bias and ‘red flags’\* were appraised as the poorest quality with all studies being deemed as inadequate/inappropriate in these areas. Describing informed consent, justification of completing data collection and strengths/limitations were also poorly reported with four out of five studies deemed inadequate/inappropriate in addressing these guidelines.

### 8.5.3. Synthesis

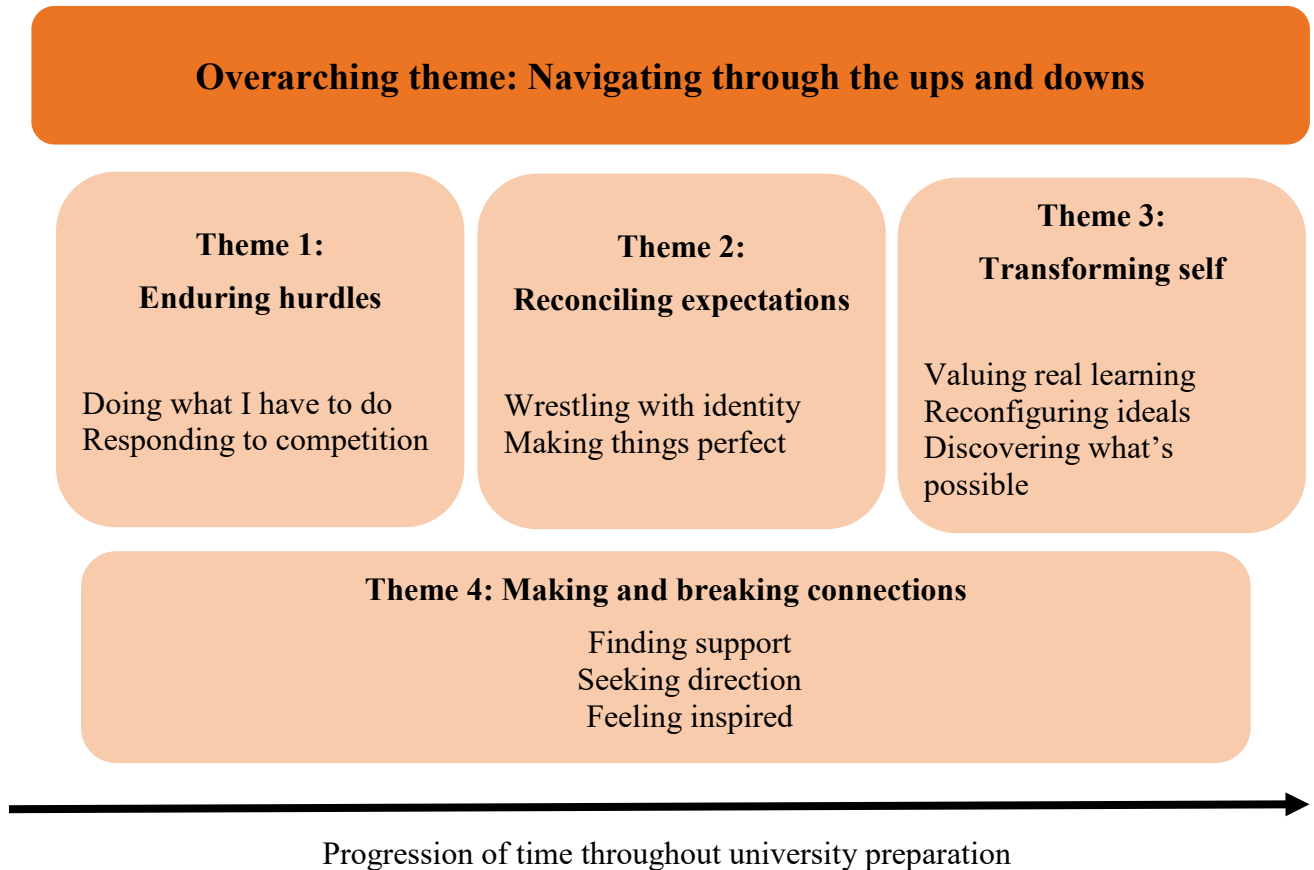
Researcher coding of studies regarding dietetics students’ experiences of their preparation and preparedness to enter the workforce generated a total of 259 codes. This was condensed into four categories of descriptive themes. The development of analytical themes resulted in one overarching theme, four main themes and ten subthemes being synthesised (Figure 8-2). The themes and subthemes identified across each study (Table 8-3) are provided, along with exemplar participant and author quotations from primary studies selected to illustrate the themes/subthemes (Table 8-4).

#### **Overarching theme: Navigating through the ups and downs**

The overarching theme encompassing the main themes captured the sentiment that students are navigating their way through dietetics education programs. The transformative journey of

*\*Red flags are features of poorly-conceived and/or executed qualitative studies which must be viewed critically. They might be flaws of the study or they may result from lack of detail in the methods described. e.g. a consent process which is vaguely discussed or the omission of ethical approval.<sup>65</sup>*

becoming a dietitian involved students experiencing both the inspiring and empowering ‘ups’ along with the challenging and taxing ‘downs.’



**Figure 8-2** Themes and subthemes identified from the analysis of students’ experience of dietetics workforce preparation

### **Enduring hurdles**

Within this theme students described experiences of enduring or surviving through the challenges faced during their preparation in order to fulfil their desire to become a dietitian. Sometimes this meant taking a short-term view to ‘get things done’ and disregarding the longer-term opportunities. Competition from others (peers) and how students responded to it was pertinent in this theme.

### *Doing what I have to do*

Participants reported doing ‘whatever it takes’ to achieve success throughout their education. Some students explained how they needed to get good grades and do activities such as volunteering, solely because they thought it would benefit their cause – not necessarily because it would enhance their learning or professional preparation. It was also apparent in this theme that students took a short-term view by directing their focus towards certain activities such as getting a placement rather than becoming a dietitian or becoming the type of dietitian they aspired to. This was also taken beyond the education experience with students’ perceiving that they would have to prioritise clinical work upon graduation before branching out into areas of interest.

### *Responding to competition*

Competition between students – particularly in regards to doing well on assessments and securing placements – was a key feature of their experience and was clearly apparent to the students. Some students responded to the competitive nature of their programs by being incentivised to do better, to try harder and to persist with their goal of being a dietitian. Others responded by being discouraged and choosing to pursue another career path outside of dietetics. The topic of competition was highly emotive for participants with one describing the process as a ‘fight’ while another explained how their ‘life would be over’ if they weren’t successful. These competitive environments embedded within dietetics programs influenced students and impacted their professional identity. A divergent view in one study challenged the dominance of peer competition in the dietetics degree, with one participant describing how students supported and encouraged each other to excel.

## **Reconciling expectations**

Within this theme, students were attempting to make cognitive adjustments between the expectations they held when coming into the program and the actual experiences they were assimilating while doing the program. As part of this, students felt conflicted about their developing identity. While progressing through their education, students were driven by their desire to make everything perfect – which was also influenced by practitioners and the profession.

### *Wrestling with identity*

Self-reflection revealed that students were conflicted about how they viewed themselves – as a person and as a professional. Students had a perception of themselves as a person which was incongruent with their perception of themselves as a dietitian, though they were attempting to marry the two identities throughout their education. This conflict was demonstrated by the example of food. On a personal level, some students saw food as enjoyable but also recognised food as a professional construct that should be taken seriously. Some students even had a ‘contentious relationship with food’ and felt ‘guilty’ about not adhering to a healthy diet. One student referred to their gratitude at having a dietetics mentor who showed them how they could merge the perceived personal-professional dichotomy to ‘make it all work’.

### *Making things perfect*

Students being prepared for the workforce shared a sense of altruism and a desire to make things perfect. Through their educational journey, students were able to embody their love of nutrition and people, to make a ‘meaningful contribution’ and to ‘make a difference.’ This was further enacted outside the program where volunteering activities enabled participants to

‘feel good’. While one participant saw dietetics work as ‘wholesome’, some students linked perfectionism with competence and credibility. This extended beyond the knowledge and skills they were acquiring and resulted in them feeling pressured to be an ideal weight or to be thin. One student described wanting to be a healthy weight to make their advice ‘more credible’ and ‘believable’, while another expressed frustration that other health professionals were able to come in ‘all shapes and sizes’. These ideals were perceived as being embedded in and perpetuated by both the profession and dietetics education programs.

**Table 8-3** Themes and subthemes identified in each study included in the synthesis of dietetics students’ experiences of workforce preparation

Theme	Reference				
	Atkins <sup>68</sup>	Lordly <sup>69</sup>	MacLellan <sup>70</sup>	McCall <sup>71</sup>	Palermo <sup>72</sup>
1. Enduring hurdles					
a. Doing what I have to do	●	●		●	●
b. Responding to competition	●	●			●
2. Reconciling expectations					
a. Wrestling with identity	●	●	●		
b. Making things perfect	●	●	●		●
3. Transforming self					
a. Valuing real learning	●	●	●	●	●
b. Reconfiguring ideals	●	●	●		
c. Discovering what’s possible		●	●	●	●
4. Making and breaking connections					
a. Finding support	●	●		●	
b. Seeking direction		●		●	●
c. Feeling inspired	●	●		●	●

### Transforming self

Within this theme, dietetics students experienced a transformation throughout their education as they came to value experiences which they perceived as ‘real’ learning. Students began with a surface or superficial level of understanding of dietetics practice and then developed a deeper understanding of the profession. Throughout this transformation, students realised the

professional possibilities for themselves in dietetics, while their ideals, beliefs and perceptions about dietetics (and themselves) were challenged and changed.

### *Valuing real learning*

Over the course of their degree, students came to appreciate experiences that provided ‘real’ learning. They described placement sites as the settings in which they became aware of the work of a dietitian and were conducive to developing competence. Learning experiences at university (e.g. lectures) were depicted as being less authentic as those experiences in a practice setting. Those placement experiences – whether positive or negative – were pivotal in influencing the future careers of some participants. Some students also described how their learning was amplified and more meaningful when experiences were not assessed. It was identified that students valued work-based learning experiences when they were provided early in their degrees as it enabled them to appreciate the ‘reality of their profession’.

### *Reconfiguring ideals*

The ideals that students entered programs with were challenged by their educational experiences. Foremost, students held pre-conceived ideas about the role of a dietitian and idealistic views about dietitians. Some students described having a ‘mental image’ of a dietitian which changed upon getting to know a dietitian, where they realised that the mental image was misconstrued. Further, some students described initial thoughts that dietitians only worked in hospitals and focused on weight loss but later became aware that it was ‘totally different’. Holding dietitians in high regard was another ideal which students reflected on. In two studies, participants were disappointed after observing that dietitians were not well respected although there was a divergent view from one participant who noticed that dietitians were ‘well respected’ by their medical colleagues. Students’ views on their own

food, nutrition and weight were also challenged throughout their degrees. Choosing ‘better ways’ to eat and reflecting on previous eating behaviours as ‘terrible’ were some of the ways in which students’ mindsets were transformed.

### *Discovering what’s possible*

The limited awareness of dietetics work that students showed coming into their degrees was replaced by a heightened awareness and enlightenment as they progressed through their education. Placement experiences were singled out as they enabled students to see what was possible in terms of their dietetics careers. By observing dietitians in a variety of settings and situations, students had their eyes opened to ‘so many different pathways’ and ‘other opportunities’ that existed in dietetics. It was also noted that students could forge their own pathways and ‘bring their own perspective’ to a dietetics role. Divergent views were evident within this sub-theme: contrary to their being enlightened by work-based experiences, some students recognised the shortcomings of placements in that they restricted student experiences and were at odds with where the profession was heading. Students recognised that there was more to becoming a dietitian than just clinical work and that opportunity existed in other settings.

### **Making and breaking connections**

Within this theme, students’ experiences of being prepared as a dietitian were influenced by those around them – predominately their peers and educators both in the academic and practice setting. Relationships evolved over the degree and placements as students connected, disconnected and reconnected with themselves and with others.

### *Finding support*

Despite competition from other students being a source of stress for participants (as per previous theme), students also sought solace from their peers. Students described how they craved personal support to help deal with the pressure generated from their education. They also felt a sense of belonging from being able to share concerns about related constructs such as ‘thinking about food’. A lack of collegiality and friendship among students was apparent with instances of feeling ‘lonely’ and ‘isolation’ described in one study. Educators – both in the academic and practice/placement settings – were seen by students as being valuable to their success. Positive encounters with dietitians while on placements were valued by students as they helped provide supportive learning experiences. Academics were also instrumental in aiding student development with one participant describing them as being ‘super helpful’ and that they ‘want you to succeed’.

### *Seeking direction*

As students attempted to navigate their way through dietetics degrees, they sought direction to reinforce their thoughts and behaviours, and to guide their professional development as a dietitian. This was apparent in the example of assessment with students attempting to figure out ‘what exactly they (supervisor) wanted’. Students looked up to their educators (academics and practitioners) as role models who could help guide them on their journeys. The observed behaviours of placement supervisors were role modelled and used by students to inform and confirm their understanding of a dietitian’s role. Students were also seeking guidance in regards to their future careers – with both placements and supervisors being key influences on the direction of students’ perceived future careers.



### *Feeling inspired*

Experiences throughout their dietetics degrees fuelled students' desires to make a meaningful contribution and resulted in students feeling inspired to create change. Placement events led one student to feel amazed by the impact that they could have on others' (patients') lives while another described the thrill of being entrusted by supervisors with the independence to practice. The personalisation of nutrition knowledge gained from their education was the impetus for some students to change their own relationship with food and adopt healthier eating behaviours. However, not all students felt inspired by their educational journey. A divergent view came from one participant who cited the emotional toll of placements as their reason for not wanting 'to do dietetics anymore'. In another example, a perceived lack of respect for dietitians was described by a student as a reason for feeling disappointed and uninspired to become a dietitian in the future.

**Table 8-4** Illustrative quotes from participants and authors of included studies regarding dietetics students' experience of their preparation

Theme/subtheme	Participant quotation	Author quotation
1: Enduring hurdles		
1a. Doing what I have to do	<ul style="list-style-type: none"> <li>• “You’re focused on the end result, just getting the grade.... You do whatever it takes.” <sup>68</sup></li> <li>• “I was on the committee, and I did that because I know that was something they looked for in the internship package.” <sup>69</sup></li> <li>• “I remember being terrified I wouldn’t get [into an internship], and I thought, what am I going to do? My life would be over. I know a lot of students feel that way.” <sup>69</sup></li> <li>• “I think most students feel...like that’s my goal, internship..., then dietitian.” <sup>69</sup></li> <li>• “You have to do some clinical to consolidate what you’ve learned and after that maybe move into some other areas” <sup>71</sup></li> </ul> <p>Divergent view:</p> <ul style="list-style-type: none"> <li>• “I’m not saying there shouldn’t be so much focus on clinical but if there’s such a small number of clinical jobs and small numbers going into it...” <sup>72</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Students’ focus was redirected to becoming an intern rather than becoming a dietitian. Students transformed their identity to meet the requirements they thought were expected or necessary to obtain an internship. <sup>69</sup></li> <li>• The student engaged in activities to advance her identity as an ideal internship applicant. <sup>69</sup></li> <li>• Students indicated that in their first graduate position they wanted to gain experience and confidence by working in an acute setting. <sup>71</sup></li> <li>• The breadth and depth of the participants’ descriptions of the role of a dietitian were linked to the work of a dietitian in a hospital. <sup>72</sup></li> </ul> <p>Divergent view:</p> <ul style="list-style-type: none"> <li>• [Participants] expressed there was an overemphasis on placement in hospital settings despite limited employment opportunities in this setting upon graduation. <sup>72</sup></li> </ul>
1b. Responding to competition	<ul style="list-style-type: none"> <li>• “We’re constantly talking about how we are competing against each other to do well in school, which is horrible but it’s true—we are all trying to get into internship.” <sup>69</sup></li> <li>• “I’ll probably apply [for an internship] next year.... The chances don’t seem too great for most people.... At the same time, are you really willing to throw away your whole degree because you aren’t up for the fight?” <sup>68</sup></li> <li>• “I hope to be a dietitian, but... due to the competition..., I might not get into the internship...” <sup>68</sup></li> <li>• “Honestly, the way I see the program, it’s competitive, so it almost fosters that type of mentality to be a perfectionist, to be everything...I realize how much mental and physical stress that can put on a person.... I’ve made a conscious effort not to be that person, even though the program here might encourage it.” <sup>69</sup></li> </ul> <p>Divergent view:</p> <ul style="list-style-type: none"> <li>• “We all try to help each other out. If someone misses class..., people will give them their notes.... Even when we applied for internship..., I still wanted my friends to get in.” <sup>69</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Participants unanimously commented on the competitive nature of their education in relation to peers in the program. <sup>68</sup></li> <li>• Competition led four of the six...students to feel conflicted about their original ambition for an internship. <sup>68</sup></li> <li>• The highly competitive nature of gaining entry into dietetics programs together with a university culture of assessment based on grades were reported to influence the participants’ philosophies of assessment. <sup>72</sup></li> <li>• Following some mentorship with a dietitian who assured [participant] that there were other options for those who do not become registered dietitians (RDs), he decided [not to apply for an internship this year] <sup>68</sup></li> <li>• Competition as a result of the internship process was an influence [on students and their professional identity development] <sup>69</sup></li> <li>• In an environment where internship is the focus and competition is intense, students may shift their focus from developing their dietitian identity to developing an ideal internship applicant identity. <sup>69</sup></li> </ul>

Theme/subtheme	Participant quotation	Author quotation
2: Reconciling expectations		
2a. Wrestling with identity	<ul style="list-style-type: none"> <li>• “I remember there was a time when... it [eating] was just something I did..., and it was lovely.... [Now] I think about food a lot.”<sup>68</sup></li> <li>• “I think it has affected my personal life more than I thought it would because I think it’s really important to practise what we learn.... I feel... that they’re judging me.”<sup>70</sup></li> <li>• “She was the best mentor.... She was able to show me how to have a professional life and a personal life and make it all work.”<sup>69</sup></li> <li>• [Participant knew] “what constitutes a balanced diet. But I don’t follow it..., which sometimes I feel guilty about... when... the professional side of me loses out.”<sup>68</sup></li> <li>• “I think of them [personal and cultural understanding of food] as pretty separate.”<sup>68</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Another participant said she didn’t realize that such an overlap would occur between her personal life and her professional life.<sup>70</sup></li> <li>• She indicated a contentious relationship with food.<sup>68</sup></li> <li>• Participants’ responses...indicated transformative experiences in their relationships with food, body, friends, family, and future career plans, which were difficult to reconcile with expectations upon entering the program.<sup>68</sup></li> <li>• In an environment where internship is the focus and competition is intense, students may shift their focus from developing their dietitian identity to developing an ideal internship applicant identity.<sup>69</sup></li> </ul>
2b. Making things perfect	<ul style="list-style-type: none"> <li>• “I knew that I wanted to help people because I have always liked to volunteer and liked to be around people...”<sup>69</sup></li> <li>• It wasn’t necessarily the job role that... attracted me to it all. I liked what I was learning. I liked that it was practical. I liked that it was wholesome and good.”<sup>69</sup></li> <li>• “I work at the soup kitchen...I think it’s just kind of a way to contribute [to] society. It is selfish in a way, because it makes me feel good that I am trying to make a difference.”<sup>69</sup></li> <li>• “I... picture[d] this career woman who has got it all together and she’s very knowledgeable and people enjoy what she has to say.”<sup>70</sup></li> <li>• “Before I start practising, I want to be at a healthy body weight...so that my advice is more credible, more believable.”<sup>68</sup></li> <li>• “You feel like you have to be thin...Doctors are allowed to do whatever they want, and nurses are allowed [to] come in all different shapes and sizes; I can’t see that taking away from their credibility, but it takes away from ours.”<sup>68</sup></li> <li>• “I make sure that I have variety... and that my family has variety.... The program taught me that.”<sup>68</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Students’ personal beliefs motivated them to engage in activities because these were related to their existing values or held meaning as an important component of learning to become a dietitian and/ or a good citizen.<sup>69</sup></li> <li>• The development of competence was also motivated and supported by participants believing that they were making a meaningful contribution to the workplace in which they were based.<sup>72</sup></li> <li>• Participants viewed dietitians as perfectionists and felt some pressure to live up to that expectation.<sup>70</sup></li> <li>• Possessing a naturally thin body size seemed to be an attribute common to these participants.<sup>68</sup></li> </ul>

Theme/subtheme	Participant quotation	Author quotation
3: Transforming self		
3a. Valuing real learning	<ul style="list-style-type: none"> <li>“developing that clinical judgment that we always get told about. I don’t really know what that ever means when I’m sitting in a lecture, but when you go into practice and you go, ‘oh, I get what that actually means now.’”<sup>72</sup></li> <li>“I liked it being on placement and it not being a graded part of the placement because I felt like, ‘okay, I can really focus on learning from this and okay if I go in there and do absolutely terribly I’m going to learn quite a bit from it,’ so that took away the stress. I wasn’t stressed going into it because it was more, ‘okay I’ve got an opportunity to really learn here.’”<sup>72</sup></li> <li>“It’s (practice experience) going to change me, and it’s going to really open my eyes and give me the experiences that you can’t get in class that [are] almost required before you get into the real world.”<sup>69</sup></li> <li>“I make sure that I have variety... and that my family has variety.... The program taught me that.”<sup>68</sup></li> <li>“I [am] convinced that [the course] changed my eating habits...I realized that what I was doing was not healthy... and [I]... started eating a healthy, balanced diet.”<sup>68</sup></li> </ul>	<ul style="list-style-type: none"> <li>Placement or ‘work-based’ assessment was viewed as ‘real’, and participants reported that this setting motivated them to develop the skills needed for practice.<sup>72</sup></li> <li>Participants associated competency development more with the placement elements of their programs than university-based learning. They reported that placement was essential for developing the competence to work as a dietitian across multiple settings.<sup>72</sup></li> <li>Participants had a fairly naive view of being a dietitian, as only a few of them had any real hands-on experience in the field.<sup>70</sup></li> <li>Participants’ suggested that the type of assessment on placement should include a range of different tasks aligned to what is actually performed in practice, rather than assessment for assessment sake.<sup>72</sup></li> <li>The participants described that placements located early in the course structure had definite benefits. They were able to understand the “reality” of their profession by exploring the practice of dietetics and experiences of the profession.<sup>71</sup></li> </ul>
3b. Discovering what’s possible	<ul style="list-style-type: none"> <li>“placements have been a good experience in terms of possible career paths. They have allowed me to gain insight into what the future may hold.”<sup>71</sup></li> <li>“The professors’ bringing in guest speakers is a big thing.... It opens up your eyes to other opportunities.”<sup>69</sup></li> <li>“I suppose at the start I thought that dietitians only work in hospitals but over the past four years, we learn that you can go into other areas. You can do food service, industry, so many different pathways.”<sup>71</sup></li> <li>“[Getting an internship is] going to change me, and it’s going to really open my eyes and give me the experiences that you can’t get in class that [are] almost required before you get into the real world.”<sup>69</sup></li> <li>“realizing...I don’t have to be...rigid. I don’t have to fit the mold exactly. I can bring my own perspective”<sup>70</sup></li> <li>“(placement experiences were) pigeon-holing dietitians into clinical domains and food service domains”<sup>72</sup></li> </ul>	<ul style="list-style-type: none"> <li>Exposure to a variety of professionals helped shape participants’ growing understanding of what being a dietitian means and broadened their view of available opportunities.<sup>70</sup></li> <li>The majority of participants indicated that placements enabled them to connect with health professionals and learn about various career paths available within the profession. They described that placements exposed students to different specialty areas of practice.<sup>71</sup></li> <li>Over the course of placements, students were able to identify different roles within their profession<sup>71</sup></li> <li>Participants also explained that they felt the different placement settings were siloed and not connected to their development of competence as a whole.<sup>72</sup></li> <li>Participants recognised that the future work of a dietitian would be in managing food services in nursing homes, providing chronic disease</li> </ul>

Theme/subtheme	Participant quotation	Author quotation
	<p>Divergent view:</p> <ul style="list-style-type: none"> <li>• “You have to do some clinical to consolidate what you’ve learned and after that maybe move into some other areas” <sup>71</sup></li> </ul>	<p>self-management in ambulatory care settings, private practice or working with the food industry. <sup>72</sup></p> <ul style="list-style-type: none"> <li>• [Participants] expressed there was an overemphasis on placement in hospital settings despite limited employment opportunities in this setting upon graduation. <sup>72</sup></li> </ul>
3c. Reconfiguring ideals	<ul style="list-style-type: none"> <li>• “I was thinking dietitians helped people lose weight.... It’s just totally different than what I expected.” <sup>70</sup></li> <li>• “Meeting [a dietitian], she very much fit this idealistic idea that I initially had.... She was very professional in her mannerisms...in sitting up straight and...wearing nice shoes. She sort of fit this mental image that I had of the dietitian, but getting to know her and realizing she’s a very real person and I don’t have to be... rigid. I don’t have to fit the mold exactly.” <sup>70</sup></li> <li>• “I expected it to be a role that was well respected and... I have kind of been... not let down, but have seen a negative aspect in that sometimes a dietitian is not respected.” <sup>70</sup></li> <li>• “sometimes dietitians are not respected and their role was not valued...whereas I know that at the pediatric hospital those dietitians are involved in every case.... They’re well respected...The doctors call them.” <sup>69</sup></li> <li>• “A lot of times the doctors take over and the dietitians kind of sit back, which isn’t the way it should be.” <sup>69</sup></li> <li>• “I was a terrible eater—I can’t believe I am in nutrition now.” <sup>69</sup></li> <li>• “I’ve always eaten pretty well, but there’s better ways I’ve now chosen to eat” <sup>68</sup></li> <li>• “I make sure that I have variety... and that my family has variety.... The program taught me that.” <sup>68</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Participants emphasized the transformative aspects of their undergraduate education. <sup>68</sup></li> <li>• Students entering the program identified aspects of their identity that appeared to be transformed when they learned and lived the process of professionalization within a specific relational context. <sup>68</sup></li> <li>• Initially, most participants had a rather simplistic and idealistic view of what a dietitian does. Most thought a dietitian worked in a hospital and taught people how to lose weight. <sup>70</sup></li> <li>• These same participants later admitted to struggles to maintain that which they had claimed came naturally. <sup>68</sup></li> <li>• Dietitian observation reinforced the value students placed on being recognized and respected by others, and the future professional role they saw for themselves. <sup>69</sup></li> </ul>

Theme/subtheme	Participant quotation	Author quotation
4: Making and breaking connections		
4a. Finding support	<ul style="list-style-type: none"> <li>• “We were a great support for each other.... You needed a lot of help getting through the program.”<sup>69</sup></li> <li>• “it’s really nice to know that you’re not the only one thinking about food.”<sup>68</sup></li> <li>• “Our professors are so helpful. They really want you to succeed and they want you to do whatever it is you want to do. They’re not... ‘Oh, you have to be a dietitian’..., but they just want you to be successful, and want to be able to teach you as much as they can before you go out into the real world... They are super helpful.”<sup>69</sup></li> <li>• “They (professors) are real people.... They tell you stories.... You feel comfortable.”<sup>69</sup></li> <li>• “She (practitioner) does a lot of networking.... She would invite me to meetings..., introduce me...”<sup>69</sup></li> <li>• “was so hard to meet people.”<sup>68</sup></li> <li>• “there is not very much support because I don’t have [a] friend... You’re [the researcher] the first person I’ve been talking with in our program for such a long time.”<sup>68</sup></li> </ul>	<ul style="list-style-type: none"> <li>• She noted her relief in talking with the other women in the program.<sup>68</sup></li> <li>• Participants noted how the program affected their relationships with others.<sup>68</sup></li> <li>• Participants unanimously commented on the competitive nature of their education in relation to peers in the program.<sup>68</sup></li> <li>• The participants reported that positive student-supervisor relationships and supervisors who created supportive learning environments created positive overall experiences.<sup>71</sup></li> </ul>
4b. Seeking direction	<ul style="list-style-type: none"> <li>• “hard to figure what exactly they [supervisor] wanted”<sup>72</sup></li> <li>• “(Professors have) all played a part in shaping my education.... They all bring a different part to the whole...”<sup>69</sup></li> <li>• “If you’ve liked the places you’ve worked, well you’re probably going to want to work there. But if you hated the placement you wouldn’t want to work there, if you had bad emotions associated with that placement.”<sup>71</sup></li> <li>• “I don’t know how I even fell into it... To be honest, I didn’t really know much about the profession.”<sup>69</sup></li> </ul>	<ul style="list-style-type: none"> <li>• [Participants’] competence was conceptualised based on placement supervisors’ role modelling, their perception of the role of a dietitian and the supervisors’ perception of competency and ‘competency-based’ assessment.<sup>72</sup></li> <li>• Placement supervisors were identified as having influence on students’ work-related career choices.<sup>71</sup></li> <li>• Student placements provide insight which may inform the choice for first graduate position in nutrition and dietetics.<sup>71</sup></li> <li>• Several participants indicated that they decided to pursue a career in dietetics because it generally fit with what they liked to do.<sup>69</sup></li> <li>• Students entered [into the program] with very little specific knowledge or understanding of what their dietitian role or identity would be.<sup>69</sup></li> </ul>

Theme/subtheme	Participant quotation	Author quotation
4c. Feeling inspired	<ul style="list-style-type: none"> <li>• “You know that guy [Mayor Bloomberg] that banned trans fat from New York? He’s...trying to get calorie contents on menus...That’s big, that’s important, that makes a difference...I kind of put that on a pedestal...I’m trying to find a job that facilitates me to be in a situation of change.”<sup>69</sup></li> <li>• “I had almost the whole [patients] family personally thanking me and it was like, that was just, blew anything out of the water that any mark could give me.”<sup>72</sup></li> <li>• “I was given basically as much rope as I wanted to and it was so relieving, because I felt like I’m running this...and...I’m being believed in that I can do this.”<sup>72</sup></li> <li>• “I [am] convinced that [the course] changed my eating habits...I realized that what I was doing was not healthy... and [I]... started eating a healthy, balanced diet.”<sup>68</sup></li> </ul> <p>Divergent view:</p> <ul style="list-style-type: none"> <li>• “I don’t want to do dietetics [anymore]. I don’t want the contact; one-on-one all the time. The constant having to talk to people is a strain for me and that’s one of the reasons why I don’t want to do it.”<sup>71</sup></li> <li>• “I have kind of been... not let down, but [have] seen a negative aspect in that sometimes dietitians are not respected and their role was not valued...”<sup>69</sup></li> </ul>	<ul style="list-style-type: none"> <li>• The development of competence was also motivated and supported by participants believing that they were making a meaningful contribution to the workplace in which they were based.<sup>72</sup></li> <li>• Participants spoke of how their relationship with food shifted within their educational context.<sup>68</sup></li> <li>• Participants reported wanting to embrace the diverse placement opportunities to enrich learning and prepare them for work, now and into the future.<sup>72</sup></li> </ul> <p>Divergent view:</p> <ul style="list-style-type: none"> <li>• A few students were distressed that it was only during placements they realised they did not desire to work in the profession.<sup>71</sup></li> </ul>

## 8.6. Discussion

This qualitative systematic review provides insight into future dietitians' experiences of being prepared for the workforce. Five qualitative studies brought together the views of 120 dietetics students who had experienced the phenomenon of workforce preparation within a nine-year period. Themes constructed from the synthesised findings demonstrated that through dietetics education, students undertake a transformational journey. They are challenged by performing in a competitive environment, by conflicting personal and professional identities and by ideals that are tested and subsequently changed. Despite this, students are driven by altruistic intentions and are inspired by seeing what is possible through meaningful learning encounters with practitioners in diverse settings. While navigating through the ups and downs of their education, students are supported and influenced by their peers and educators.

The substantial transformation described by students in this review is consistent with the professional identity development experienced by students in other health professional programs including medicine, pharmacy, nursing and physical therapy.<sup>73-76</sup> Moreover, the early and diverse exposures which facilitated this transformation were valued by the students here as they enhanced learning, highlighted potential career opportunities and exposed the realities of practice and the profession. This confirms findings from surveys of dietetics graduates that placements and experiential learning activities greatly contributed to their professional development and preparedness.<sup>77,78</sup> It also echoes requests by dietetics students for more placements in non-traditional settings which are relevant to contemporary practice.<sup>79</sup> The view of some students in this review that work opportunities existed beyond the settings in which their placements occurred reflects findings of research commissioned by national dietetics associations. Key stakeholders in both the UK and the USA have revealed concerns



around producing too many graduates with inadequate skills to match market demands<sup>80</sup> and a need to reconfigure placement experiences to improve career opportunities for graduates.<sup>19</sup> In addition to those in established areas, placements in role-emerging settings<sup>81</sup> have been shown to make valuable contributions to students' development. Their application and effectiveness in dietetics is yet to be evaluated.

One of the hurdles that students in this review described was the competitive atmosphere imbued in dietetics education programs. This is likely due, in part, to the high demand for, and shortages of, placements which has been described in the UK, USA, Canada and Australia.<sup>15,16,82-84</sup> In addition, a perceived oversupply of dietetics graduates along with limited graduate employment prospects, as described in some countries,<sup>8,17</sup> may further exacerbate this sense of competition between students. While challenging experiences can positively aid the development of student resilience,<sup>85</sup> competition among dietetics students can also result in reduced participation and collaboration during their education.<sup>86</sup> It is unclear if this manifests into longer-term traits which impact future dietitians. However, a lack of collegiality among the dietetics profession has been identified.<sup>8</sup> The origins and effects of impaired dietitian-dietitian relationships is also concerning given that national dietetics associations state their need to foster member collegiality and instil cooperation among colleagues.<sup>87,88</sup> Demonstrating collegiality in patient and client care<sup>89</sup> and collaboration with others (e.g. in a health care team) are requisite attributes for dietitians internationally.<sup>9-12,90</sup> However, a greater focus on developing positive relationships between dietetics students and between all stakeholders in dietetics education may benefit students, the entire profession and ultimately, the nutrition-related health of populations.

The perfectionist views and altruistic intentions held by students in this review are worthy of further consideration. The 'hidden curriculum' – the values, attitudes and behaviours unintentionally learned by students through observing educators – has been

shown to influence the development of students throughout their education.<sup>91,92</sup> Though its existence and impact in dietetics is less clear than in other health professions, previous research has identified that perfectionism is a personality trait of dietitians<sup>93</sup> and that dietetics supervisors are motivated by altruism.<sup>94</sup> It is plausible then that dietetics students may be subconsciously adopting attributes of the dietitians preparing them for the workforce. While perfectionism and altruism are not necessarily attributes that impede dietetics care, the embodiment of existing workforce traits by emerging practitioners may be promoting attribute homogeneity and conformism in dietetics. National associations that represent dietetics professionals have themselves called for greater diversity in dietetics to service an increasingly diverse and dynamic society.<sup>19,95</sup> This review supports those recommendations and provides further impetus for attracting and recruiting dietetics students with diverse characteristics, and for celebrating the diversity that currently exists in dietetics student populations.

Making positive connections with educators and viewing them as role models, as described by students in this review, has important implications for dietetics education. These perspectives confirm the views of graduate dietitians who saw their educators as supportive and influential on their professional development.<sup>96</sup> Given that students appear to be focused on securing placements and getting good grades for self-advancement, educators need to use their influence with students to help them take a longer-term view of their education. While the impact of educators on dietitians' career paths is less well known, it is evident in other disciplines, including medicine and nursing, that educators can significantly influence future practitioners' careers.<sup>97-99</sup> Beyond the academic setting, exposing students to role models in practice settings during their education has strong and demonstrated impacts on students' future professional endeavours.<sup>100-102</sup> Greater application of this concept in dietetics

education could inspire students to thrive in the challenging healthcare landscape, create new work opportunities and forge dietetics careers in novel areas of practice upon graduation.

The implications for future practice and research from this review's findings can be addressed in multiple ways. Dietetics students' perspectives on what constitutes effective learning activities throughout their education, as demonstrated in this review, should be integrated into dietetics curricula. Such strategies could improve graduate preparedness and enhance future practitioner effectiveness. Although providing evidence of students' feedback on their education is an accreditation requirement for dietetics programs,<sup>10,103-105</sup> the extent and effectiveness of this evaluation process in dietetics has not been published in the peer-reviewed literature. In order to prevent competition negatively impacting students and the profession, strategies are needed to incentivise collaboration in dietetics education at all levels – between students, across placement sites and among universities. To further address competition and improve students' experiences, the findings of this review reaffirms previous calls for: more dietitians to become supervisors;<sup>106,107</sup> flexibility around settings in which students can develop competence;<sup>108</sup> and embracing alternate models of student supervision.<sup>109</sup>

While the finding that educators are role models should alert or remind educators to reflect on how they may be viewed by students, it also warrants further consideration of the dietitians that students are exposed to throughout their education. If dietetics graduates are to thrive in increasingly challenging health care environments, students need exposure to and experiences with dietetics exemplars who have demonstrated success in existing and emerging areas of practice. This review has also highlighted the value of qualitative inquiry in workforce preparation as this approach moves beyond more quantitative evaluations of individual activities undertaken as part of education experiences. Future qualitative syntheses of other key stakeholders' experiences in dietetics workforce preparation – such as

supervisors and graduates – could provide further insights and implications for enhancing dietetics education. In addition, further research that compares the experiences of students enrolled in different health professional programs may illuminate shared challenges faced by these emerging practitioners and highlight those experiences that are unique to dietetics students in order to improve their preparation. Finally, the finding that qualitative studies regarding students' broad experiences of their education have only been published in two countries, highlights the urgent need for similar research in other areas facing challenges associated with dietetics education, such as the UK and the USA.

#### **8.6.1. Strengths and limitations**

This is the first study to systematically review and synthesise dietetics students' experiences of their preparation for the workforce. A systematic approach was taken to search for, appraise and synthesise findings from included studies. The researchers – all female dietetics educators with experience in qualitative research – were well-positioned to make judgements on the collective meaning of the synthesised findings. Prior to the analysis, the researchers acknowledged their positions and that their experience of preparing dietitians for the workforce would, to some extent, influence the interpretation of students' reported experiences. The use of multiple researcher perspectives throughout this review ensured that data was comprehensively translated from primary studies and that the synthesised themes reflected participant perspectives.<sup>63</sup> While employing a second researcher to screen all citations by title and abstract may have yielded additional records for full-text reviewing, the high level of agreement between reviewers in screening a subset of citations indicated reliability for ascertaining eligible studies. In addition, verbatim quotes from study participants and authors have been presented to enable readers to make their own determinations and to ensure that the original meaning was not misconstrued.<sup>24</sup>

While researchers' used the reported criticisms of, and debate surrounding, the utility of qualitative syntheses<sup>26</sup> to strengthen the methodological quality of this review, some limitations are acknowledged. Firstly, this review's findings are limited by the small number of studies included. This clearly denotes that the topic under investigation is an emerging one with a demonstrated need for more research, especially in countries with large and well-established dietetics workforces such as the UK and USA.<sup>14</sup> Further, with the included studies being conducted in different countries this may have resulted in participants experiencing markedly different phenomena which could have impacted researcher interpretation and synthesised findings. The presence of selection bias and 'red flags' within all included studies, as assessed by the researchers, is another limitation worthy of consideration. While these aspects may have been addressed in each study but not reported by the authors, it limits the quality and transferability of this review's findings. Finally, some concepts which were identified through the coding and analysis process (e.g. students' motivations for choosing dietetics as a career) which were not relevant to the review's aim were omitted from the final themes presented.

### **8.6.2. Conclusions**

With more than 45,000 students completing dietetics degrees internationally each year and only five published studies exploring dietetics students' broad experiences of being prepared for the workforce, this review has highlighted the need for significantly more research on this topic. Research focused on dietetics students' experiences of their education can be used to design and implement curricula and placement activities that are relevant, meaningful and subsequently effective for future dietitians. With the 'student-as-consumer' landscape existing in contemporary higher education, investigating students' views are important for stakeholders, now more than ever. Strategies that focus on exposing dietetics students to

inspirational practitioners, increasing and celebrating diversity in academic/placement settings, and incentivising collaboration across all levels of dietetics education could act as catalysts to enhance the experience of dietetics students and the nutrition-related health of those they will ultimately serve.

### **8.7. Disclosures**

The authors declare that they have no conflict of interests.

### **8.8. Acknowledgements**

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## **Chapter 9.      Discussion and Conclusions**

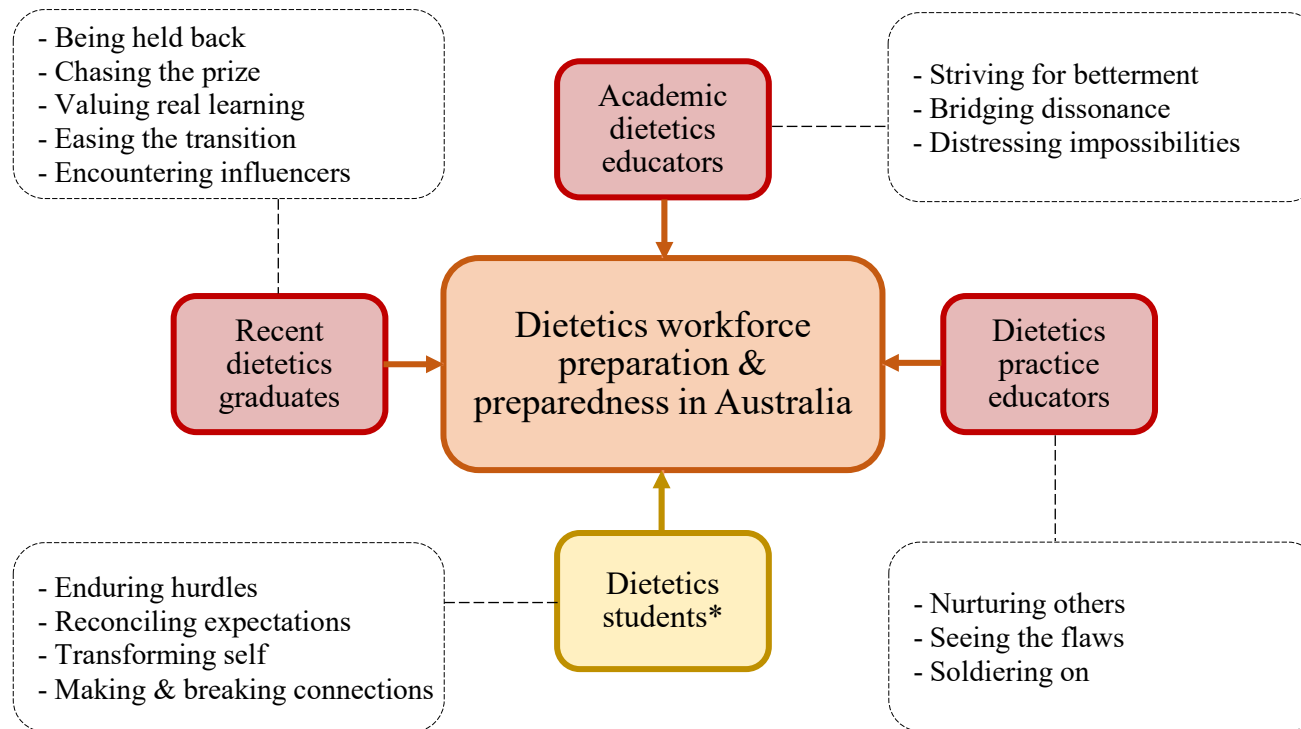
## **9.1. Preface**

This chapter brings together the key findings from each of the six studies conducted in this thesis (Chapters 2, 4, 5, 6, 7 & 8) and indicates how they have contributed original knowledge to the evidence base regarding dietetics workforce preparation and preparedness. It also describes the strengths and limitations of the research conducted. Implications for future practice are outlined, as are opportunities for advancing knowledge on this topic through future research.

## **9.2. Summary of main findings**

This thesis has taken multiple approaches to exploring the phenomena of dietetics workforce preparation and preparedness in Australia. A systematic mapping review provided a ‘map’ of the existing research that has been conducted in Australia and highlighted gaps in the evidence to inform subsequent studies (Chapter 2). Quantitative methods were employed to enumerate and profile the professional attributes of the academic dietetics educators who are integral in preparing dietitians in Australia (Chapter 4). Qualitative explorations of academic dietetics educators (Chapter 5), dietetics practice educators (6), and recent dietetics graduates (Chapter 7) in Australia revealed the experiences of, and challenges faced by, these key stakeholders. Finally, a systematic review and qualitative synthesis illuminated the experiences of dietetics students being prepared for the workforce (Chapter 8).

A summary of synthesized findings across these studies (Chapters 2, 4, 5, 6, 7 & 8) is provided, as well as the main themes identified across the qualitative studies that explored key stakeholders’ experiences (Figure 9-1) and the key findings and implications (Table 9-1).



**Figure 9-1** Main themes identified from key stakeholders' experiences of the phenomena being explored in this thesis

\* Dietetics students experiences were systematically synthesized from existing literature which included students outside of Australia.

### **9.2.1. Key findings on workforce data**

There is a significant lack of data on the emerging (and existing) dietetics workforce in Australia. The most recent national data on Australian dietetics graduates' outcomes were published over 25 years ago. Claims that there is an oversupply of dietetics graduates and that graduates are increasingly embarking on careers in emergent areas such as private practice are yet to be validated with robust statistics. Further, analyses of how dietetics work areas in Australia are evolving and assessments of potential challenges and opportunities in future work settings are unclear. This lack of evidence impedes the ability of dietetics education programs, and the key stakeholders embedded in them, to ensure that future dietitians are optimally equipped for contemporary practice and future market needs. It also presents a risk to individuals considering dietetics as an occupation and to students already enrolled in dietetics education programs who are restricted in their ability to make informed career decisions. As a profession which is committed to using best-available evidence to inform practice, this lack of evidence related to the state of the workforce itself warrants action.

### **9.2.2. Key findings on stakeholder motivations**

The key stakeholders involved in dietetics workforce preparation and preparedness in Australia are motivated to do 'good' work. For example, students highly value 'real' learning activities while practice educators take great satisfaction in witnessing students develop and academic educators are driven to enhance the preparation of the future profession. This indicates that emerging and established dietitians are intrinsically motivated by their need for fulfilment being satisfied and supports the application of self-determination theory across the stakeholder groups. Given the challenges faced by all key stakeholder groups as described in this thesis, understanding their motivations to help create contexts that support their desire to achieve optimal performance is important for the dietetics profession into the future.

### **9.2.3. Key findings on preparation and practice**

Participants in each of the key stakeholder groups explored in this thesis revealed that there is misalignment between what dietetics graduates in Australia are being prepared for and what they need to be prepared for. Areas of practice and settings where dietitians work appear to be increasingly diverse. While traditionally, dietetics graduates in Australia have been prepared for work in three main areas of practice (i.e. individual case management (ICM), community and/or public health nutrition (CPHN) and food service management (FSM)) the contemporary practice landscape has become broader. However, the current accreditation standards for Australian dietetics education programs still stipulate that students should complete placements in three areas (i.e. medical nutrition therapy (MNT), public health nutrition (PHN) and food service systems (FSS)). In addition, these areas are somewhat incongruent with the main areas where dietitians work according to the DAA (i.e. hospitals, private practice, community). While student placements are not limited to only occur in these areas, stakeholders recognize the need for greater flexibility in the standards that underpin dietetics education programs to ensure that future preparation and practice are well-aligned.

### **9.2.4. Key findings on system issues**

The systems in which Australian dietetics workforce preparation stakeholders operate are constraining and impacting their ability to optimally function. For example, academic practice educators and dietetics practice educators feel the higher education and health systems in which they are embedded increasingly expect them to ‘do more with less’ which impacts their ability to deliver quality student experiences. Further, dietetics students are impeded by the competitive environment imbued within dietetics education programs and the lack of support mechanisms for graduates transitioning into the workforce limits their ability to flourish as novice practitioners. The constraints of dietetics education programs in

Australia and the standards that underpin them were recognized across the stakeholder groups. That is, dietetics graduates are restricted by being prepared for work in a limited range of areas while being underprepared to embrace opportunities to practice in emergent areas. Identifying strategies to address these system constraints could improve outcomes for all stakeholders.

#### **9.2.5. Key findings on stakeholder support**

Key stakeholders involved in dietetics workforce preparation and preparedness in Australia value support as it enables them to fulfil their aspirations and facilitates their ability to do quality work. For example, academic dietetics educators required more support in trying to reach the unattainable expectations associated with their roles, while practice educators recognized that good communication and support from universities was instrumental in delivering quality student placements. Dietetics students acknowledged that support from peers, educators and practitioners was valuable in navigating through their degrees, while graduates similarly valued support from these other stakeholders while transitioning into the workforce. While support was valued, all key stakeholder groups identified areas where additional support was required to enhance their work to subsequently deliver better outcomes for the dietetics profession.

#### **9.2.6. Key findings on collaboration and collegiality**

A lack of collaboration and collegiality within the profession, along with a sense of isolation and frustration, was identified by the key stakeholders explored in this thesis. Academic dietetics educators and dietetics practice educators both lamented the apparent reluctance of fellow educators to share relevant knowledge and resources. In addition, both groups felt that preparing dietitians was the shared responsibility of the entire workforce and should be more fairly distributed across the profession. Dietetics students reported feeling lonely and isolated

throughout their preparation while graduates felt alone in their endeavors to secure work as a novice dietitian. While collaboration with others, including clients and stakeholders, is a key aspect of the competency standards for all dietitians in Australia, strategies are required to enhance collaboration and collegiality between dietitians themselves.

In summary, the research conducted in this thesis has identified that:

- data on the dietetics workforce in Australia is lacking;
- stakeholders embedded in dietetics workforce preparation and preparedness in Australia are motivated;
- there is misalignment between dietetics workforce preparation and practice in Australia;
- stakeholders embedded in dietetics workforce preparation and preparedness in Australia feel constrained by the systems in which they operate;
- stakeholders embedded in dietetics workforce preparation and preparedness in Australia value the support of others in performing their roles; and
- collaboration and collegiality within the dietetics profession in Australia is lacking.

These key findings along with their associated implications are further highlighted within each study as outlined in Table 9-1 below.



**Table 9-1** Summary of key findings and associated implications from each study conducted in this thesis

Chapter 2. Systematic Mapping Review of Dietetics Workforce Preparation and Preparedness Research		
Objective/s	Key findings	Implications
<p>To systematically map and summarise existing research regarding dietetics workforce preparation and preparedness that has been conducted in Australia.</p> <p>To identify gaps in the literature to inform future priority areas in Australian dietetics education research.</p>	<ul style="list-style-type: none"> <li>• Sixty-eight studies were identified and included in the review</li> <li>• Dietetics education research in Australia has spanned almost 30 years with more than half of studies (51%; 35/68) published in the last five years.</li> <li>• The greatest proportion of research was conducted in the university setting (43%; 29/68), with students as participants (48%; 43/90) and was focused on the medical nutrition therapy area of dietetics practice (43%; 29/68).</li> <li>• Published studies involving graduates (14%; 13/90); conducted in the workplace (12%; 8/68); and regarding emerging areas of dietetics practice (0%; 0/90) are lacking.</li> <li>• Employment outcomes of dietetics graduates across Australia were last published over 25 years ago.</li> </ul>	<ul style="list-style-type: none"> <li>• Research and dissemination activities that provide data and evidence regarding recent dietetics graduates, their views, their attributes and their entry into the workforce</li> <li>• Create a national database to profile dietetics graduate attributes to enable: the dietetics profession to analyse trends in the emerging workforce; dietetics educators to plan and execute relevant curricula activities; and dietetics students and graduates to manage their career expectations and to make informed decisions on future career paths</li> <li>• Research regarding stakeholders who are impacted by, the service provided by graduates (e.g. employers, clients)</li> <li>• Develop strong leadership and academic collaboration within the dietetics education sector (e.g. research) that capitalises on shared resources and addresses shared issues</li> <li>• Demonstrate how knowledge and skills developed in established practice areas (e.g. MNT) may be transferable to other practice areas (e.g. private practice)</li> <li>• Develop data and research to ensure that graduates are well prepared for a range of practice areas and that dietetics education is effective in meeting the needs of our dynamic and evolving workforce</li> <li>• Develop research: on graduates, employers and academic educators: in workplace settings; regarding emerging areas (e.g. private practice); conducted across multiple/combined states/territories</li> </ul>

## Chapter 4. Professional Attributes of the Academic Dietetics Educator Workforce

Objective/s	Key findings	Implications
To describe the core academic dietetics educator workforce in Australia by profiling the size, demographic, education, experience and practice attributes of educators employed in dietetics education programs in Australian universities.	<ul style="list-style-type: none"> <li>• From 147 academic dietetics educators identified, 91 participated (response rate = 62%), including at least one from each university offering a dietetics education program in Australia.</li> <li>• Participants were typically female aged 30–39 years with a Lecturer level, full-time appointment who cited clinical dietetics as their main area of practice specialisation.</li> <li>• Around half of the sample had yet to complete a PhD and had five years or less of experience working as a dietetic educator or a dietetic researcher.</li> <li>• The sample was not representative of more senior educators, and therefore the core academic dietetics educator workforce.</li> </ul>	<ul style="list-style-type: none"> <li>• Develop ongoing and more consistent data collection and dissemination activities to enumerate and profile the dietetics educator workforce, including sessional/casual staff</li> <li>• Institute mechanisms to support emerging dietetics educators to conduct research and achieve PhD-level qualifications, as is required in the university setting</li> <li>• Take a national approach to explore the experiences of, and challenges faced by, academic dietetics educators across Australia and in other countries with established and emerging dietetics workforces</li> <li>• Implement targeted recruitment activities to enhance diversity in the academic dietetics educator workforce (e.g. more males, more with private practice experience)</li> <li>• Implement strategies (e.g. national surveys) to ensure that the academic dietetics educator workforce is equipped to deliver quality dietetics graduates for the benefit of the profession</li> </ul>

## Chapter 5. Exploration of Academic Dietetics Educators' Experiences

Objective/s	Key findings	Implications
To explore the experiences of, and challenges faced by, academic dietetics educators in preparing dietitians for the workforce in Australia.	<ul style="list-style-type: none"> <li>• The overarching theme of 'aiming for a moving target' was underpinned by the themes of: 1) striving for betterment; 2) bridging dissonance and 3) distressing impossibilities.</li> <li>• Academic dietetics educators were driven to enhance the preparation of dietitians but acknowledged disparity between what graduates are being prepared for and what they need to be prepared for.</li> <li>• Heightened expectations of others, professional constraints and a lack of collegiality among the profession were among the challenges that manifested in a sense of frustration, concern and isolation.</li> <li>• Dietetics educators face numerous challenges in their efforts to prepare graduates who are well-equipped for increasingly diverse dietetics practice.</li> </ul>	<ul style="list-style-type: none"> <li>• Recognize dietetics educators' efforts in order to maintain and enhance their performance and productivity</li> <li>• Harness the collective motivation of dietetics educators nationally to facilitate collaborative problem-solving, share innovations and champion common causes</li> <li>• Ensure curricula reform delivers dietetics graduates who are relevant in an increasingly diverse and dynamic practice environment</li> <li>• Ensure program accreditation requirements are flexible to address the oversupply of dietetics graduates who are under-equipped for embracing contemporary opportunities</li> <li>• Provide students with more diverse experiences in non-traditional settings, in underserved areas and in role-emerging placements to help pioneer new pathways.</li> <li>• Develop data on practice areas and workforce trends in Australia so dietetics education programs produce a workforce that can anticipate and meet market demands</li> <li>• Incentivise and engage the entire profession to share the responsibility of cultivating future dietitians</li> <li>• Bring together dietitians with shared concerns and interests to enhance collegiality among the workforce.</li> <li>• Further explore the experiences of these and other key stakeholders' perspectives (e.g. dietetics practice educators and dietetics graduates) in Australia and internationally</li> <li>• Explore potential solutions to the challenges faced by these key stakeholders to advance dietetics education and the profession</li> </ul>

## Chapter 6. Exploration of Dietetics Practice Educators' Experiences

Objective/s	Key findings	Implications
To explore dietetics practice educators' experiences of, and challenges faced in, dietetics workforce preparation in Australia	<ul style="list-style-type: none"> <li>• Three main themes – 1) nurturing others; 2) seeing the flaws; and 3) soldiering on – were developed from the data.</li> <li>• Practice educators take great satisfaction in witnessing students develop and are focused on cultivating future practitioners with authentic learning activities.</li> <li>• However, they are impacted by perceived shortcomings of the systems in which they operate and believe that broadening the scope of dietetics placements to better align with contemporary practice could benefit graduates and the profession.</li> <li>• Despite these challenges, practice educators are pragmatic in getting on with their roles and recognise the advantages gained from student placements.</li> </ul>	<ul style="list-style-type: none"> <li>• Broaden the scope of student placements to ensure the profession is relevant and responsive to future market needs</li> <li>• Develop evidence on how dietetics students can demonstrate competence in broader, contemporary areas of practice</li> <li>• Recognise and celebrate the efforts of dietetics practice educators and the advantages gained from student placements (e.g. through awards programs)</li> <li>• Incentivise more dietitians to become practice educators and to collaboratively develop projects where new opportunities for placements are required</li> <li>• Ensure adequate training of dietetics practice educators and consistent placement processes to ensure quality placements, greater student autonomy, and better prepared graduates</li> <li>• Conduct a national audit of existing professional development and training resources which could be centralised to promote consistency, collaboration and good practice</li> <li>• Trial and evaluate placement models that can maintain or enhance placement quality while increasing practice educator capacity and equipping graduates</li> <li>• Implement national networking events, virtual discussions and online platforms that bring educators together to advance practice, disseminate resources and address shared concerns</li> <li>• Develop alternative ways of conceptualising and approaching perceived challenges (e.g. coaching students to manage expectations about placements and future work roles)</li> </ul>

## Chapter 7. Exploration of Recent Dietetics Graduates' Experiences

Objective/s	Key findings	Implications
To explore recent dietetics graduates' experiences of, and challenges faced, in dietetics workforce preparation and preparedness in Australia	<ul style="list-style-type: none"> <li>• Five themes were identified across the data set including: 1) being held back; 2) chasing the prize; 3) valuing real learning; 4) easing the transition; and 5) encountering influencers.</li> <li>• While graduates appreciated their preparation, they were not empowered or equipped to embrace opportunities in diverse and emerging areas of dietetics practice.</li> <li>• Graduates were challenged by the competitive landscape of securing obvious job opportunities and by a lack of support in transitioning into the workforce.</li> <li>• Practice exposures and encounters with influential dietitians were highly valued.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure dietetics education programs and the standards that underpin them are responsive to market needs and reflect contemporary areas of dietetics practice</li> <li>• Develop research that envisions the future direction of the dietetics profession in Australia to ensure that dietitians, and the programs preparing them, are responsive and relevant</li> <li>• Develop evidence on role-emerging dietetics placements to promote role expansion, act as a precursor to graduate employment &amp; ensure preparation-practice alignment</li> <li>• Provide students with experiences across diverse practice contexts to illustrate the breadth of possible careers and address the competitive landscape resulting from supply/demand mismatches in dietetics</li> <li>• Develop enhanced support mechanisms for novice dietitians transitioning into the workforce, both earlier in their education programs and following graduation</li> <li>• Encourage students to engage in formal and informal peer interactions throughout university to enhance peer collaboration and support, and to reduce competition</li> <li>• Empower and increase exposure of students to potential mentors (from dietetics and other fields e.g. business) to initiate mentoring relationships early in education programs</li> <li>• Ensure integration of theory and practice throughout dietetics education programs to expedite student performance</li> <li>• Develop more data on graduates' career paths and evidence regarding their experiences of entering the workforce</li> </ul>

## Chapter 8. Qualitative Synthesis of Dietetics Students' Experiences

Objective/s	Key findings	Implications
To synthesise dietetics students' experiences of dietetics workforce preparation.	<ul style="list-style-type: none"> <li>• Five studies met the inclusion criteria and the views of 120 dietetics students from two countries (Australia, Canada) over a 9- year period were synthesised.</li> <li>• The overarching theme of 'navigating through the ups and downs' was underpinned by four main themes: 1) enduring hurdles; 2) reconciling expectations; 3) transforming self; and 4) making and breaking connections.</li> <li>• Dietetics students undertake a transformational journey through dietetics education.</li> <li>• They are inspired by seeing what is possible through meaningful encounters with practitioners in diverse settings.</li> <li>• However, they are challenged by competitive environments and perceived ideals that are embedded in the profession.</li> </ul>	<ul style="list-style-type: none"> <li>• Develop more research on dietetics students' experiences of their education both in Australia and in other countries (e.g. UK, USA)</li> <li>• Ensure more supervisors and placements in non-traditional settings that are relevant to contemporary practice to avoid producing too many dietetics graduates with inadequate skills to match market demands and to improve graduate career opportunities</li> <li>• Incentivise collaboration, enhance collegiality and foster positive relationships between dietetics students and all stakeholders in dietetics education to benefit the profession</li> <li>• Attract and recruit dietetics students with diverse characteristics to produce a profession capable of servicing an increasingly diverse and dynamic society</li> <li>• Ensure dietetics educators (in academia and practice settings) encourage students to take a longer-term view of their education</li> <li>• Expose dietetics students to inspirational practitioners and role models in practice settings to inspire them to create new work opportunities and forge careers in emerging areas</li> <li>• Ensure dietetics students' perspectives on what constitutes effective learning activities is integrated into dietetics curricula.</li> </ul>

### **9.3. Strengths and limitations**

The strengths and limitations of each individual study in this thesis have been discussed in the preceding chapters (Chapters 2, 4, 5, 6, 7 & 8). However, an overall summary of the strengths and limitations of this thesis is provided below.

A major strength of this thesis was that it took a national approach to investigating a national phenomenon from the perspective of key stakeholders. Dietitians are prepared through dietetics education programs offered in six states/territories across Australia. However, the systematic mapping review revealed that to-date, dietetics education scholarship in Australia has been conducted in a piecemeal and non-strategic manner, usually confined to one university or one state. Taking a national approach enabled insights to be obtained from a variety of key stakeholders who had varying levels of experience, across an array of dietetics practice areas and from a range of geographical locations. Such an approach has enhanced the transferability of findings to other contexts and settings and provides impetus for researchers, educators and practitioner in other countries and other health professions to conduct similar research.

The systematic mapping review (conducted in the early stages and formalized in the later stages of this thesis) resulted in a ‘map’ of the existing research regarding dietetics workforce preparation and preparedness to be developed. This also enabled gaps in the evidence to be identified and informed the development and implementation of subsequent studies in this thesis. Taking such a strategic approach to developing knowledge ensured that the research in this thesis made an original contribution to the existing body of evidence. It also provided a baseline and future guide for educational scholarship in dietetics.

Multiple researcher perspectives were incorporated into all studies in this thesis. The same researchers assumed the same roles in each of the qualitative studies exploring

stakeholders' experiences of the phenomena. The primary researcher (KM) conducted all 53 key stakeholder interviews, transcribed the audio recording and/or checked the transcripts for accuracy and coded all transcripts prior to analysis. Two additional researchers (DR & SS) were then involved in data analysis and the development of themes across each qualitative study, along with the primary researcher (KM). Other researchers then reviewed each of the studies findings and contributed to the interpretation of findings and development of future implications. In addition, multiple researchers were involved in all aspects of both systematic reviews (mapping review and thematic synthesis) conducted in this thesis. The multi-researcher approach enhanced quality, was consistent across studies and enabled a richer understanding of the phenomena being investigated.

All studies exploring key stakeholders' experiences of the phenomena in this thesis demonstrated rigour and displayed principles of 'good' qualitative research, as outlined in accepted qualitative research guidelines. This included confirmability, credibility, dependability, transferability, descriptive validity and interpretive validity. In addition, the importance of fit, integration of theory, comprehensive documentation, owning one's perspective, and grounding findings in examples have been demonstrated throughout the qualitative studies. Further, researchers were explicit in establishing their positionality and clarifying how research elements (from epistemology through to methods) were aligned. Highlighting rigour and quality in qualitative research enhances the likelihood of findings being considered, accepted and applied by others.

Finally, multiple sources of data from multiple informants were incorporated in this thesis to provide a rich understanding of the phenomena (crystallization). The in-depth insights of 53 participants from four key stakeholder groups located across the country enabled a comprehensive diversity of perspectives to be obtained. While convergence upon one single 'reality' was not the aim of the qualitative studies, themes identified as common



across the different key stakeholder groups corroborated the overall findings and strengthened the rationale for synthesising future practice and research implications.

A potential limitation of this research was that it focused on the phenomena in Australia, rather than taking an international approach which may have enhanced transferability to other settings. While some aspects of, and challenges faced in, dietetics workforce preparation and preparedness may be shared across some countries, dietetics education and the experiences associated with it, may be markedly different in each country/region. For example, requirements for students to complete a dietetics education program may vary depending on the country, their professional standards, the national dietetics association and the health workforce landscape. In qualitative research, participants who are being explored in a study should have experienced a similar phenomenon. Therefore, an international approach to the studies conducted in this thesis was not appropriate.

The research conducted in this thesis was limited by the lack of data on the dietetics workforce in Australia. This paucity of information made it difficult to report on and compare the challenges faced by key stakeholders with established statistics. For example, while many key stakeholders described how graduates are increasingly entering the workforce in private practice roles, there is no sound evidence to validate this workforce trend. It is also, therefore, challenging for key stakeholders involved in preparing dietitians to advocate for a greater educational focus on equipping (and to subsequently prepare) graduates for working in a private practice setting. Until robust and consistent data on the dietetics workforce is collected and disseminated, key stakeholders will continue to be challenged to prepare these emerging practitioners based on contemporary workforce needs.

The diversity of experiences obtained in this thesis could have been enhanced by the inclusion of other key stakeholders. For example, graduate employers and patients/clients receiving the service of recent graduate dietitians, could also be well-placed informants to

comment on the preparation and preparedness of emerging dietitians. In addition, non-dietitian stakeholders (e.g. other health professionals working in health care settings) may also be able to provide broader perspectives into the phenomena. However, the key stakeholders selected to share their experiences in this thesis were purposely chosen due to their being embedded in the phenomena. This ensured that participants were well-placed to comment and provide in-depth insights on dietetics workforce preparation and preparedness in Australia.

Finally, the findings presented in this thesis should be viewed in light of the changing nature of national professional standards. In Australia, national competency and accreditation standards for dietitians are generally reviewed and updated every five years. At the time this research was conducted, updated accreditation and competency standards were being phased in to university dietetics programs across Australia. Such changes highlight the importance of ongoing research to ensure that dietetics programs, and the standards that underpin them, are reflective of, and responsive to, market needs.

## **9.4. Implications and recommendations**

The implications for each study in this thesis have been provided in preceding chapters (Chapters 2, 4, 5, 6, 7 & 8). However, a synthesized summary of the implications for future practice and research from across studies is provided below.

### **9.4.1. Implications for future practice**

To help maintain and enhance motivation, the efforts of dietetics educators in academic and placement settings as well as dietetics students and graduates need to be recognized and celebrated. Understanding key stakeholders' motivations can assist in creating contexts that support their desire to achieve optimal performance. Given the challenges described by all

stakeholder groups in this thesis, harnessing and leveraging this collective motivation is important to ensure the performance of stakeholders and the dietetics profession into the future.

Recommendation:

1. Establish a national awards programs to recognize innovations and excellence in dietetics workforce preparation, including exemplar stakeholders (e.g. practice educators) and achievements (e.g. outcomes from student placement projects)

The collective motivation of stakeholders could also be harnessed and leveraged to incentivise collaboration between stakeholders (e.g. students, graduates), across settings (e.g. placement sites) and across states (e.g. university dietetics departments). Strategies that incentivize key stakeholders to collaborate more may also help to reduce the perceived constraints of the systems in which they are operating. Setting examples for and encouraging students to collaborate more may have broader and longer-term effects on both the established and emerging professions. Enhancing collegiality between dietetics workforce preparation stakeholders will likely benefit the stakeholders involved, as well as the wider profession and the health of those they serve.

Recommendations:

2. Encourage, empower and engage students to work collaboratively throughout their dietetics education programs and beyond (e.g. through formal and informal networks)
3. Establish collaborative networks across sites and settings (i.e. universities and placement sites) for stakeholders to share knowledge and resources (e.g. workshop materials, assessment guidelines/rubrics, effective placement models)

Given the lack of support identified across key stakeholder groups, mechanisms are required to support key stakeholders involved in dietetics workforce preparation and preparedness. In particular, educators need support to help deliver quality student experiences while managing their demanding workloads and students need support to navigate through their education. Moreover, support is urgently needed to assist dietetics graduates transitioning into the workforce. In addition to key stakeholders providing support to each other, dietitians who are not currently involved in dietetics workforce preparation must also be incentivized to contribute to the future profession. Support from the professional association is also required to progress activities that enhance the performance of all key stakeholders and benefit the profession.

#### Recommendations:

4. Establish (and encourage students/graduates to establish) support mechanisms to assist graduates transitioning into the workforce (e.g. national forums and online platforms for sharing experiences, work opportunities, professional development resources)
5. Facilitate connections between students and mentors and communicate the landscape around entering the dietetics workforce early in dietetics education programs
6. Showcase projects and develop resources that demonstrate the benefits of student experiences/placements to incentivize dietitians currently not involved in dietetics workforce preparation to contribute to the future profession
7. Advocate to the professional association for greater support in activities that aim to optimize performance and deliver better outcomes in dietetics workforce preparation

The perceived misalignment between dietetics workforce preparation and practice must be addressed to ensure the relevance of the future profession. The practice settings in which students can develop competence must be broadened to reflect contemporary and emergent areas of practice and to enable scholarship and research in these areas. This would also allow the responsibility of preparing dietitians to be shared more broadly across the profession by enabling more dietitians to become involved in dietetics workforce preparation. For this to be actioned, the standards that underpin dietetics education programs must be more flexible and responsive to market needs.

Recommendation:

8. Allow greater flexibility and encourage innovation in dietetics education programs by broadening the scope of practice settings where students can demonstrate competence to better match contemporary practice needs (i.e. in private practice, food industry)

#### **9.4.2. Implications for future research**

There is an obvious and pressing need for more data on the emerging and existing dietetics workforces in Australia. Data that establishes the state of the current workforce, including the areas and settings where dietitians practice along with an assessment of how these areas are evolving is a fundamental need for the future profession. Further, data that enumerates and profiles the characteristics of graduates entering the workforce is required. Such information can be used to confirm or refute claims that there is an oversupply of dietetics graduates in Australia, to ensure that dietetics workforce preparation and practice are well-aligned.

### Recommendations:

9. Establish a consistent and coordinated approach to collecting and disseminating robust and current data on the dietetics workforce in Australia
10. Collate data to demonstrate how the dietetics workforce in Australia is evolving including an analysis of workforce trends and patterns

Research is required to envision the dietetics workforce of the future according to multiple key stakeholder groups, including areas for potential growth and opportunity as well as the challenges likely to impact the workforce. Such evidence will help to ensure that dietitians and the programs that prepare them are relevant and responsive to market needs. Ensuring that preparation is aligned with contemporary and future practice will benefit the entire profession as well as the nutrition-related health of individuals, groups and populations.

### Recommendation:

11. Conduct research that envisions the future dietetics workforce in Australia and to anticipate the potential opportunities and challenges that may be presented to dietitians in the future

More evidence is necessary to help advocate for broadening the scope of practice settings in which students can develop competence and to ensure that student experiences reflect contemporary areas of dietetics practice. Research on the benefits and outcomes of students undertaking role-emerging and non-traditional placements in broader and more diverse areas of practice will help emerging dietitians to forge new professional pathways and help share the responsibility of preparing dietitians more broadly among the workforce.

Recommendation:

12. Develop and implement studies that demonstrate how dietetics students can develop competence in role-emerging and non-traditional settings

While the knowledge generated in this thesis provides an indication of the experiences of and challenges faced by key stakeholders in dietetics workforce preparation and preparedness, ongoing research is required to further substantiate the perspectives shared here and to confirm the extent of them. In addition to further qualitative explorations, national surveys of students' and graduates' experiences may help to inform dietetics education curricula and to enhance the experience of students and graduates in the future.

Recommendation:

13. Develop and implement ongoing national surveys to further investigate the experiences of and challenges faced by dietetics students and graduates in Australia

Given the challenges described by participants in this thesis, key stakeholders in dietetics workforce preparation would benefit from research that aims to develop solutions to the challenges raised. Dietetics education stakeholders may also benefit from looking to other health professional education literature for potential solutions. In addition, future research should focus on models that can optimise education, placement and mentoring activities and subsequently deliver better outcomes for key stakeholders in dietetics education.

Recommendations:

14. Conduct research that develops solutions to the challenges faced by key stakeholders in dietetics workforce preparation and disseminate the findings

15. Conduct research to implement and evaluate models in dietetics education that have been demonstrated as effective in other health professional education literature

Future dietetics education research should be informed by the gaps identified in the systematic mapping review conducted in this thesis. That is, more research is required on graduates and employers; in workplace settings and regarding competency development in emerging areas of dietetics practice. Further, the systematic mapping review should be updated as more research regarding dietetics workforce preparation and preparedness emerges.

Recommendation:

16. Address the gaps identified in the systematic mapping review conducted in this thesis (e.g. conduct research on graduates and in workplace settings)

Finally, exploring the experiences of key stakeholders in dietetics workforce preparation and preparedness in other countries is required. This is especially important in areas where challenges have been identified e.g. UK, USA, Canada.

Recommendation:

17. Take a national approach to exploring key stakeholders' experiences of dietetics workforce preparation and preparedness in other countries (e.g. UK, USA)



## **9.5. Conclusions**

The dietetics workforce is ideally-positioned to play a key role in advancing health globally. Ensuring that emerging dietitians are well-equipped to address contemporary and future challenges is essential for the profession and for the health of those they will serve. However, the studies conducted in this thesis have revealed that key stakeholders embedded in dietetics workforce preparation and preparedness face numerous challenges. These include a paucity of workforce data, a lack of collegiality within the profession, and constraints imposed by the systems in which they are embedded. Moreover, there appears to be a misalignment between what dietitians are being prepared for and what they need to be prepared for. Strategies that ensure dietetics workforce preparation is well-aligned with contemporary and future practice needs are required. Mechanisms that harness the collective motivation of, provide support for, and incentivize collaboration between, all key stakeholders in dietetics workforce preparation are needed for the benefit of emerging workforce and the entire profession. Further, a strategic and coordinated approach to collecting and disseminating data on the dietetics workforce is essential to inform dietetics workforce planning and to ensure that the future dietetics workforce is relevant and responsive. Finally, ongoing exploration of key stakeholders' experiences of dietetics workforce preparation and preparedness, along with research to explore potential solutions to the challenges revealed in this thesis, will only serve to benefit the dietetics profession.

## **Appendices**

## **Chapter 1 Appendices**

**Table S1-1** Dietetics education programs in Australia by state/territory and program level as at 2014 and 2018

State / University	June 2014				July 2018			
	Masters-Level	Bachelor-Level	Total Programs	Total Universities	Masters-Level	Bachelor-Level	Total Programs	Total Universities
<b>ACT</b>	<b>1</b>	<b>-</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>-</b>	<b>1</b>	<b>1</b>
University of Canberra	1	-	-	-	1	-	-	-
<b>NSW</b>	<b>3</b>	<b>2</b>	<b>5</b>	<b>4</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>3</b>
Charles Sturt University	1 <sup>#</sup>	-	-	-	-	-	-	-
The University of Newcastle	-	1	-	-	-	1	-	-
The University of Sydney	1	-	-	-	1	-	-	-
University of Wollongong	1	1	-	-	1	1	-	-
<b>QLD</b>	<b>3</b>	<b>3</b>	<b>6</b>	<b>5</b>	<b>2</b>	<b>3</b>	<b>5</b>	<b>5</b>
Bond University	1 <sup>#</sup>	-	-	-	1	-	-	-
Griffith University	1	1	-	-	-	1 <sup>*</sup>	-	-
Queensland University of Technology	-	1	-	-	-	1	-	-
The University of Queensland	1	-	-	-	1	-	-	-
University of the Sunshine Coast	-	1	-	-	-	1 <sup>*</sup>	-	-
<b>SA</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>1</b>
Flinders University	1	1	-	-	1	1	2	1
University of South Australia	1	-	-	-	-	-	-	-
<b>VIC</b>	<b>3</b>	<b>2</b>	<b>5</b>	<b>4</b>	<b>4</b>	<b>-</b>	<b>4</b>	<b>4</b>
Deakin University	1	-	-	-	1	-	-	-
Monash University	-	1	-	-	1	-	-	-
La Trobe University	1 <sup>#</sup>	1 <sup>#</sup>	-	-	1 <sup>*</sup>	-	-	-
Victoria University	1 <sup>#</sup>	-	-	-	-	-	-	-
Swinburne University of Technology <sup>#</sup>	-	-	-	-	1 <sup>#</sup>	-	-	-
<b>WA</b>	<b>2</b>	<b>-</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>-</b>	<b>2</b>	<b>2</b>
Curtin University	1 <sup>#</sup>	-	-	-	1	-	-	-
Edith Cowan University	1 <sup>#</sup>	-	-	-	1	-	-	-
<b>Total</b>	<b>14</b>	<b>8</b>	<b>22</b>	<b>18</b>	<b>12</b>	<b>6</b>	<b>18</b>	<b>16</b>

\*Indicates where composite programs (e.g. Bachelor of Health Science and Master of Dietetics) and honours programs (e.g. Bachelor and Bachelor with Honours) have been counted as one program

# Indicates programs that are seeking accreditation

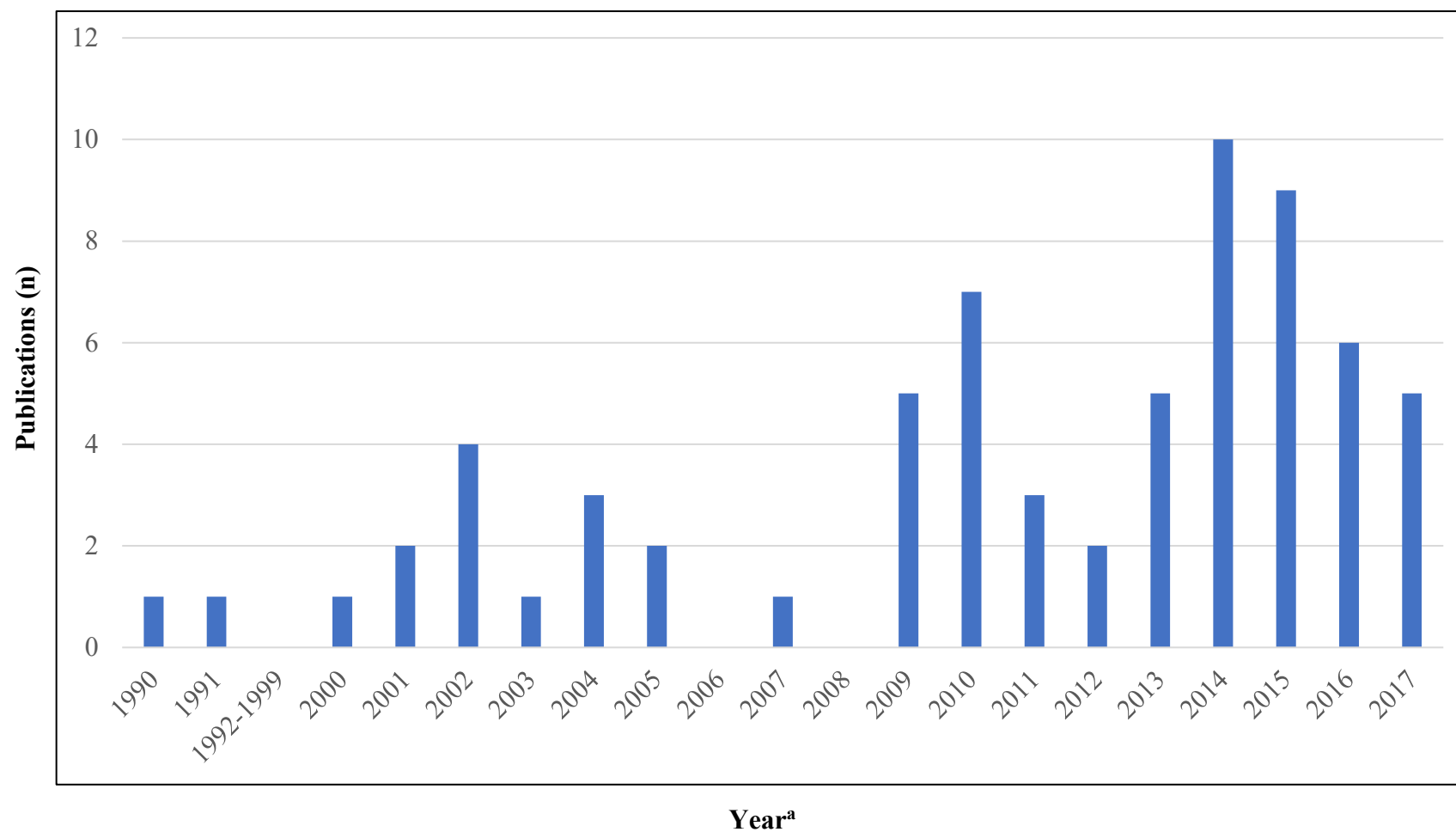
**Table S1-2** Number of students completing dietetics education programs internationally

Country of National Dietetic Association	Students qualifying per year (2016 data)
1. Japan	19535
2. Brazil	8000
3. Korea	8000
4. Mexico	4000
5. United States	4000
6. India	2500
7. Turkey	1633
8. Chile	1251
9. France	700
10. Philippines	700
11. Germany	600
12. Spain	600
13. Canada	565
14. Argentina	500
15. Australia	500
16. Taiwan	500
17. Greece	400
18. United Kingdom	400
19. Italy	350
20. Netherlands	320
21. Portugal	300
22. South Africa	300
23. Malaysia	250
24. Israel	230
25. Belgium	150
26. Switzerland	130
27. Pakistan	100
28. Sweden	100
29. Hungary	90
30. New Zealand	90
31. Austria	80
32. Nigeria	65
33. Caribbean	40
34. Norway	40
35. Indonesia	30
36. Ireland	25
37. Finland	20
38. Hong Kong	15
39. Singapore	5
40. Iceland	4
41. Luxembourg	3
<b>Total</b>	<b>57121</b>

## **Chapter 2 Appendices**

**Table S2-1** Full search strategy for identifying dietetics workforce preparation and/or preparedness research conducted in Australia

<b>Medline (Ovid)</b>
(Dietetic*.mp. or exp Dietetics/) and (student*.mp. or exp Students/ or graduate*.mp. or educator*.mp. or teacher*.mp. or academic*.mp. or lecturer*.mp. or supervisor*.mp. or preceptor*.mp.) and ((workforce* or prepar* or education*).mp. or exp Education/ or training*.mp. or placement*.mp. or internship*.mp. or practice*.mp. or assess*.mp. or universit*.mp. or curricul*.mp. or competen*.mp.) [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
<b>CINAHL</b>
(Dietetic* OR (MH "Dietetics")) AND ( student* OR graduate* OR educator* OR teacher* OR academic* OR lecturer* OR supervisor* OR preceptor* ) AND ( workforce* OR prepar* OR education* OR (MH "Education+") OR training* OR placement* OR internship* OR practice* OR assess* OR universit* OR curricul* OR competen* )
<b>EMBASE</b>
dietetic*:ti,ab OR 'dietetics'/exp AND (student*:ti,ab OR 'students'/exp OR graduate*:ti,ab OR educator*:ti,ab OR teacher*:ti,ab OR academic*:ti,ab OR lecturer*:ti,ab OR supervisor*:ti,ab OR preceptor*:ti,ab) AND (workforce*:ti,ab OR prepar*:ti,ab OR education*:ti,ab OR 'education'/exp OR training*:ti,ab OR placement*:ti,ab OR internship*:ti,ab OR practice*:ti,ab OR assess*:ti,ab OR universit*:ti,ab OR curricul*:ti,ab OR competen*:ti,ab)
<b>ERIC</b>
(Dietetic* OR (DE "Dietetics")) AND ( student* OR graduate* OR educator* OR teacher* OR academic* OR lecturer* OR supervisor* OR preceptor* ) AND ( workforce* OR prepar* OR education* OR training* OR placement* OR internship* OR practice* OR assess* OR universit* OR curricul* OR competen* )
<b>PsycInfo (Ovid)</b>
(Dietetic*.mp. or exp Dietetics/) and (student*.mp. or exp Students/ or graduate*.mp. or educator*.mp. or teacher*.mp. or academic*.mp. or lecturer*.mp. or supervisor*.mp. or preceptor*.mp.) and ((Workforce or prepar* or education*).mp. or exp Education/ or training*.mp. or placement*.mp. or internship*.mp. or practice*.mp. or assess*.mp. or universit*.mp. or curricul*.mp. or competen*.mp.) [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]
<b>Informit</b>
(dietetic*) AND (student* OR graduate* OR educator* OR teacher* OR academic* OR lecturer* OR supervisor* OR preceptor*) AND (workforce* OR prepar* OR education* OR training* OR placement* OR internship* OR practice* OR assess* OR universit* OR curricul* OR competen*)



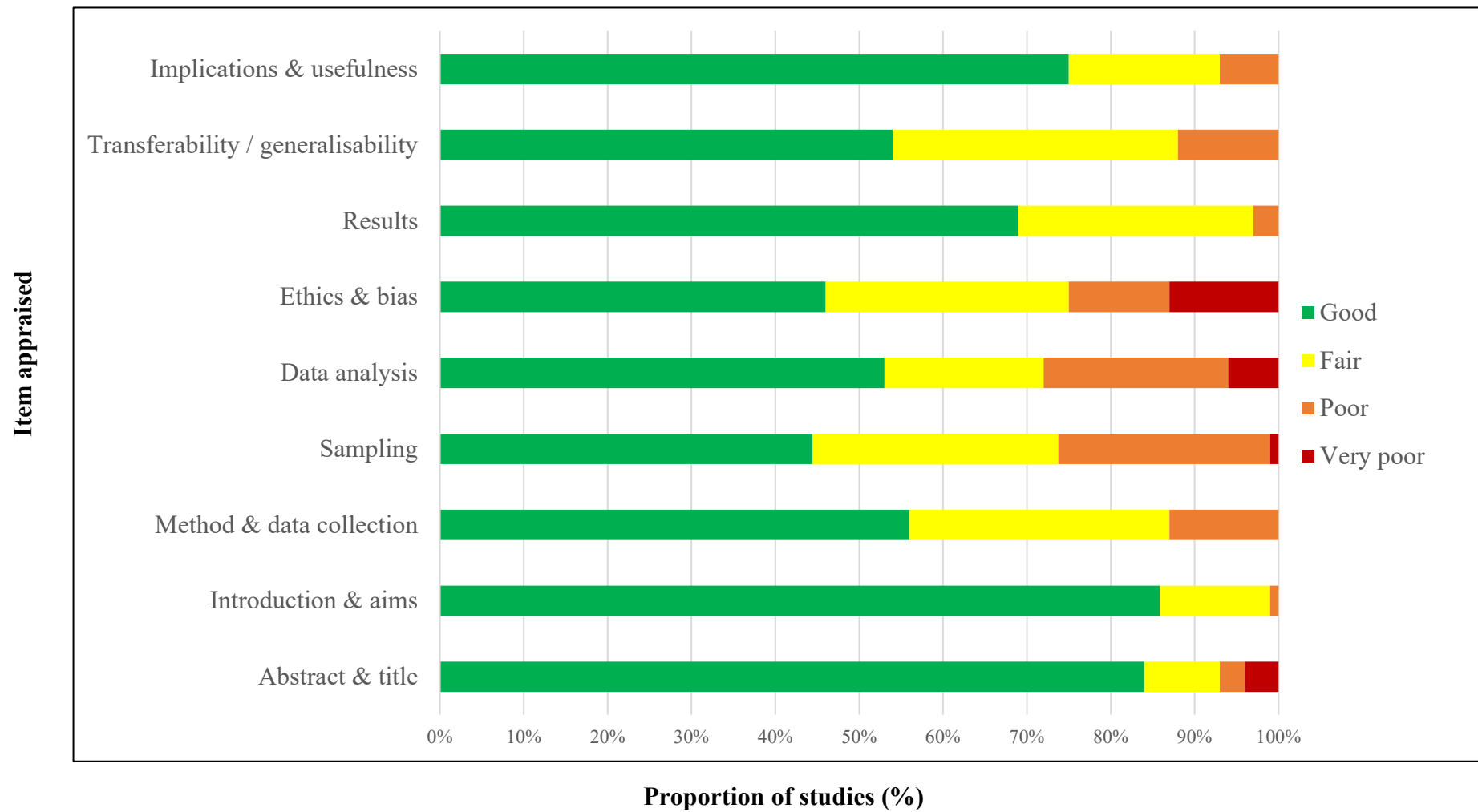
**Figure S2-1** Number of publications regarding dietetics workforce preparation and preparedness research in Australia by year

<sup>a</sup> Indicates year that study was first published (e.g. published in print or online) which may differ from the issue year of the study



\*Table is included as a separate attachment due to Excel format and A3 size.

University



**Figure S2-2** Pooled results of the quality appraisal for all studies included in the systematic mapping review

## **Chapter 4 Appendices**

**Table S4-1** Survey instrument used to collect data from academic dietetics educators

<b>Section A - You</b>
1. Title
2. First Name
3. Surname
4. Educational Institution / University
5. Faculty / School
6. City / town
7. State
8. Contact phone
9. Contact email
<b>Section B - Your Profile</b>
10. Gender
11. Age range
12. Current individual APD status
13. Position title with educational institution
14. Appointment fraction at educational institution
15. Number of hours actually worked at/for educational institution per week
16. Proportion of time allocated to research / teaching / other activities at educational institution
17. Highest formal qualification in dietetics
18. Area of highest formal qualification in dietetics
19. Highest formal qualification in education
20. Area of highest formal qualification in education
21. Years since graduating as a dietitian
22. Years of experience working as a dietitian in practice (outside of dietetic education)
23. Main area of specialisation as a practising dietitian (outside of dietetic education)
24. Years of experience working as a dietetic educator
25. Main area of specialisation as a dietetic educator
26. Years of experience working as a dietetic researcher
27. Main area of specialisation as a dietetic researcher
28. Number of journal article publications in nutrition / dietetic research
29. Number of HDR students (MRes, PhD) you have supervised / co-supervised to completion
30. Number of HDR students (MRes, PhD) you currently supervise / co-supervise
<b>Section C - Your Program</b>
31. Number of dietetic programs being delivered at your organisation
32. Level of dietetic program/s being delivered at your organisation
33. Accreditation status of dietetic Bachelor program/s being delivered at your organisation
34. Accreditation status of dietetic Masters program/s being delivered at your organisation
35. Accreditation status of dietetic Postgrad Diploma program being delivered at your organisation
36. When did you last develop or re-develop a subject / unit in a dietetics program
37. When did you last deliver or teach into a subject / unit in a dietetics program
38. When did you last convene or co-convene a subject / unit in a dietetics program
39. Area / domain for which you are a designated lead in your university's dietetics program
40. Are you the program or course coordinator / convenor for your university's dietetics program

**Table S4-2** Comparative analysis of study participants' and non-participants' attributes

<i>Attribute</i>	<i>Percentage of participants (n=91) (%)</i>	<i>Percentage of non-participants (n=56) (%)</i>	<i><math>\chi^2</math> goodness of fit test</i>
Gender			
Male	7.7	12.5	$\chi^2=1.8$ P=0.18
Female	92.3	87.5	
APD status			
APD	84.6	76.8	$\chi^2=10.1$ <b>P=0.02</b>
Advanced APD	9.9	12.5	
FDAA	4.4	5.4	
Not an APD	1.1	5.4	
Academic appointment level with university <sup>(a,b)</sup>			
A (Associate Lecturer / Senior Teaching Fellow)	4.4	1.8	$\chi^2=5.0$ P=0.42
B (Lecturer / Assistant Professor B)	39.6	42.9	
C (Senior Lecturer / Assistant Professor A)	22.0	19.6	
D (Associate Professor)	12.1	19.6	
E (Professor)	7.7	7.1	
Other (e.g. Clinical Educator, Project Manager, Placement Coordinator)	14.3	8.9	
Highest level of qualification (dietetics or other) <sup>(b)</sup>			
Level 7 – Bachelor degree	6.6	5.4	$\chi^2=8.8$ <b>P=0.03</b>
Level 8 – Bachelor degree (Hons), Graduate Certificate, Graduate Diploma	18.7	10.7	
Level 9 – Masters degree	26.4	12.5	
Level 10 – Doctoral degree	48.4	62.5	
Unable to be determined	-	8.9	
Number of journal article publications in nutrition and/or dietetics research			
1-9	32	28.6	$\chi^2=13.5$ <b>P=0.02</b>
10-19	13	19.6	
20-29	4	5.4	
30-39	7	5.4	
40-49	2	-	
50+	12	23.2	
Have not performed this activity	21	7.1	
Unable to be determined	-	10.7	

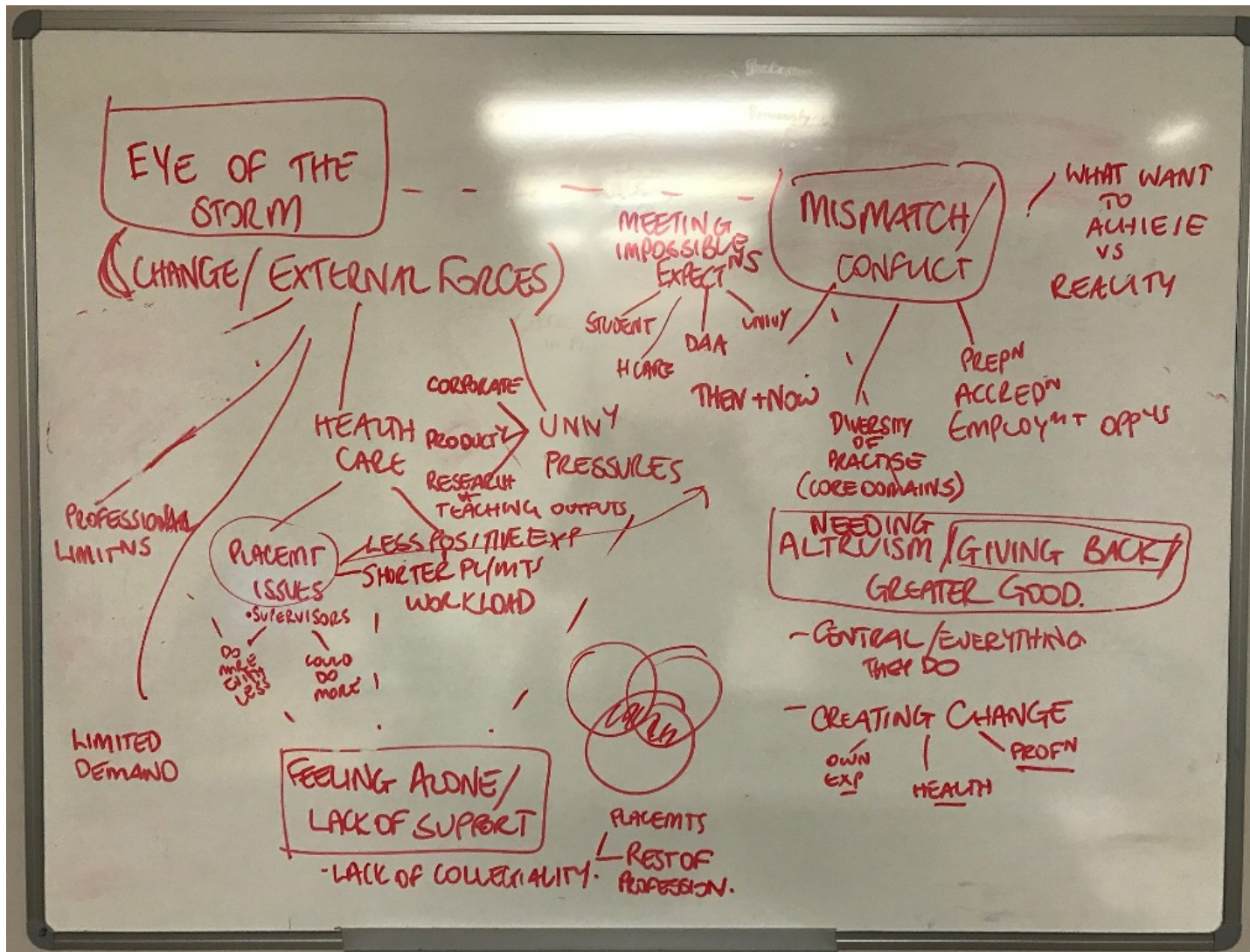
a. Bond University and University of Canberra academic appointment levels are similar but not direct equivalents of other universities

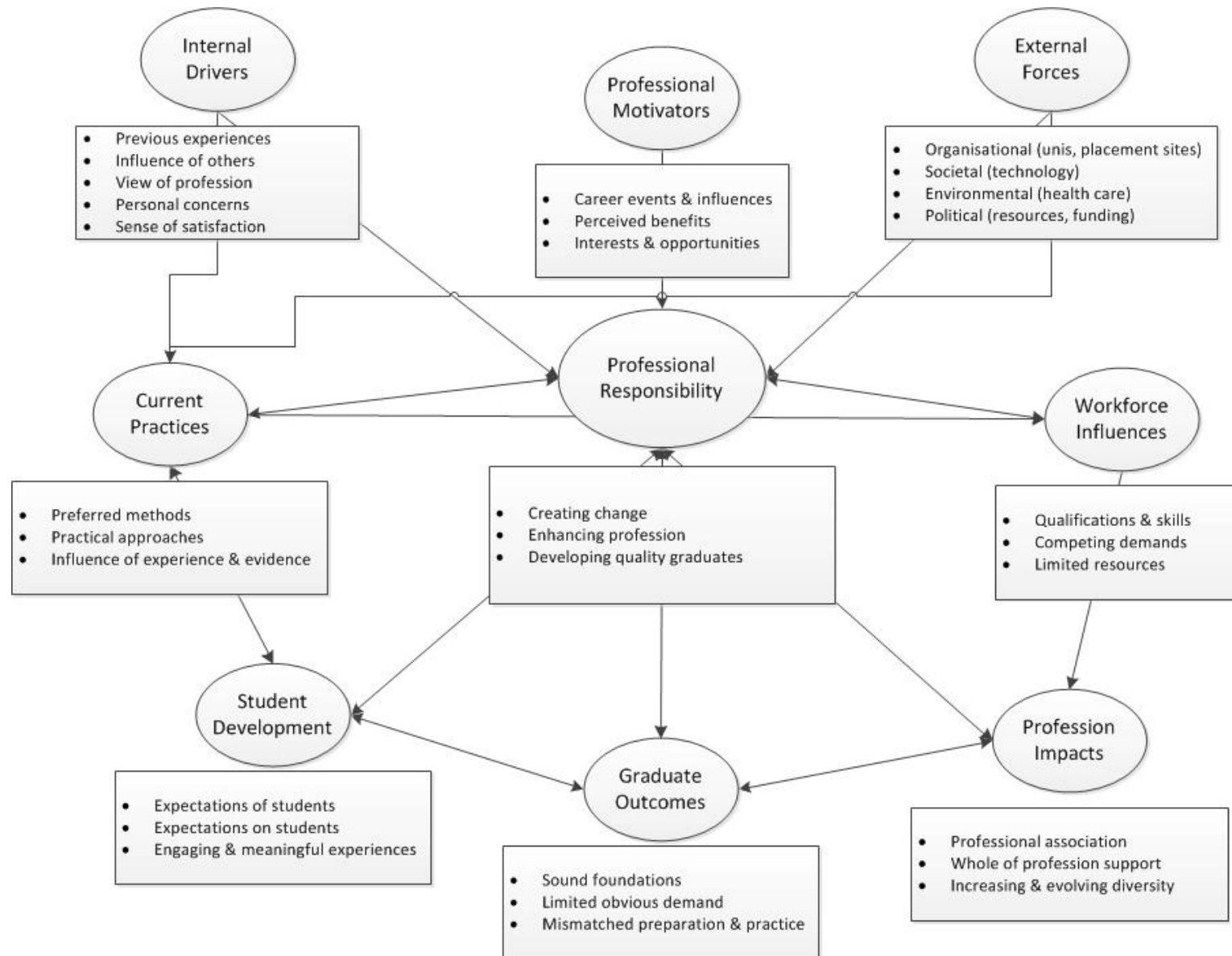
b. Academic appointment level is inferred from position title provided in the sample or derived from publicly-available university websites

**Bold** text indicates attributes where Chi-square analysis indicated a statistically significant difference between the participants' and the non-participants' attributes

## **Chapter 5 Appendices**

**Figure S5-1** Thematic maps developed through data analysis of academic dietetics educators' experiences







**Table S5-1** Demographic and professional attributes of dietetics educators (n=15) who participated in interviews regarding dietetics workforce preparation

<i>Attribute</i>	<i>Number of participants (n)</i>	<i>Proportion of participants (%)</i>
Gender		
Female	13	86.7
Male	2	13.3
Age range		
30-39 years	4	26.7
40-49 years	7	46.7
50-59 years	4	26.7
State/Territory		
Australian Capital Territory	1	6.7
New South Wales	3	20.0
Queensland	3	20.0
South Australia	2	13.3
Victoria	3	20.0
Western Australia	3	20.2
Current APD <sup>(a)</sup> status		
APD <sup>(a)</sup>	9	60.0
AdvAPD <sup>(b)</sup>	5	33.3
FDAA <sup>(c)</sup>	1	6.7
Highest level of educational qualification <sup>(d)</sup>		
Level 8 – Bachelor degree (Honours), Graduate Certificate, Graduate Diploma	2	13.4
Level 9 – Masters degree	3	20.0
Level 10 – Doctoral degree	10	66.7
Academic appointment level with university		
Level B (Lecturer / Assistant Professor B)	5	33.3
Level C (Senior Lecturer / Assistant Professor A)	5	33.3
Level D (Associate Professor)	2	13.3
Level E (Professor)	3	20.0
Appointment fraction with university		
1.0 FTE <sup>(e)</sup>	10	66.7
0.7 FTE <sup>(e)</sup>	1	6.7
0.5 FTE <sup>(e)</sup>	3	20.0
0.2 FTE <sup>(e)</sup>	1	6.7
Proportion of time allocated to teaching		
10%	2	13.3
30%	3	20.0
40%	5	33.3
50%	1	6.7
75%	1	6.7
80%	1	6.7
100%	2	13.3

**Table S5-1** (continued)

Proportion of time allocated to research		
0%	3	20.0
10%	1	6.7
20%	1	6.7
25%	1	6.7
30%	1	6.7
40%	5	33.3
50%	1	6.7
70%	1	6.7
90%	1	6.7
Proportion of time allocated to administration / service / other		
0%	4	26.7
10%	1	6.7
20%	5	33.3
30%	3	20.0
40%	1	6.7
50%	1	6.7
Years of experience working as a dietitian in practice (outside dietetics education)		
1-5 years	3	20.0
6-10 years	6	40.0
11-15 years	1	6.7
16-20 years	4	26.7
21-25 years	1	6.7
Main area of specialisation as a practising dietitian (outside dietetics education)		
Individual Case Management	12	80.0
Community and/or Public Health Nutrition	3	20.0
Years of experience working as a dietetics educator		
1-5 years	4	26.7
6-10 years	3	20.0
11-15 years	7	46.7
26-30 years	1	6.7
Main area of specialisation as a dietetics educator		
Individual Case Management	4	26.7
Community and/or Public Health Nutrition	4	26.7
Food Service Management	1	6.7
General nutrition / nutrition and dietetics	1	6.7
Dietetics education	1	6.7
Sports nutrition	2	13.3
Student placements/internships	1	6.7
Research	1	6.7

**Table S5-1** (continued)

Years of experience working as a dietetics researcher		
<1 year	2	13.3
1-5 years	4	26.7
6-10 years	2	13.3
11-15 years	6	40.0
21-25 years	1	6.7
Main area of specialisation as a dietetics researcher		
Individual Case Management	5	33.3
Community and/or Public Health Nutrition	3	13.3
General nutrition / nutrition and dietetics	1	6.7
Dietetics education	2	13.3
Sports nutrition	1	6.7
Other	2	13.3
Have not performed this activity	1	6.7
Level of dietetics program/s being delivered at university		
Bachelor degree	4	26.7
Masters degree	8	53.3
Bachelor and Masters degree	3	20.0

(a) APD = Accredited Practising Dietitian; (b) AdvAPD = Advanced Accredited Practising Dietitian; (c) FDAA = Fellow of the Dietitians Association of Australia; (d) as per the Australian Qualifications Framework levels; (e) FTE = full-time equivalent.

**Table S5-2** Qualitative research review guidelines – RATS checklist for academic dietetics educators’ experiences study

ASK THIS OF THE MANUSCRIPT	THIS SHOULD BE INCLUDED IN THE MANUSCRIPT	Page no.*	Line no.*
R Relevance of study question			
Is the research question interesting?	Research question explicitly stated	5	51-53
Is the research question relevant to clinical practice, public health, or policy	Research question justified and linked to the existing knowledge base (empirical research, theory, policy)	4-5	32-51
A Appropriateness of qualitative method			
Is qualitative methodology the best approach for the study aims? <ul style="list-style-type: none"> <li>Interviews: experience, perceptions, behaviour, practice, process</li> <li>Focus groups: group dynamics, convenience, non-sensitive topics</li> <li>Ethnography: culture, organizational behaviour, interaction</li> <li>Textual analysis: documents, art, representations, conversations</li> </ul>	Study design described and justified i.e., why was a particular method (e.g., interviews) chosen?	5 6	56-58, 78-83
T Transparency of procedures			
<i>Sampling</i>			
Are the participants selected the most appropriate to provide access to the type of knowledge sought by the study? Is the sampling strategy appropriate?	Criteria for selecting the study sample justified and explained <ul style="list-style-type: none"> <li><i>theoretical</i>: based on preconceived or emergent theory</li> <li><i>purposive</i>: diversity of opinion</li> <li><i>volunteer</i>: feasibility, hard-to-reach groups</li> </ul>	5-6	61-63, 71-77
<i>Recruitment</i>			
Was recruitment conducted using appropriate methods?	Details of how recruitment was conducted and by whom	5-6	71-77

ASK THIS OF THE MANUSCRIPT	THIS SHOULD BE INCLUDED IN THE MANUSCRIPT	Page no.*	Line no.*
Is the sampling strategy appropriate? Could there be selection bias?	Details of who chose not to participate and why	8 19	120-123 382-384
<i>Data collection</i>			
Was collection of data systematic and comprehensive? Are characteristics of the study group and setting clear? Why and when was data collection stopped, and is this reasonable?	Method(s) outlined and examples given (e.g., interview questions) Study group and setting clearly described  End of data collection justified and described	6  Table S1 5 6 7	78-87  All 58-66 92-96 108-110
<i>Role of researchers</i>			
Is the researcher(s) appropriate? How might they bias (good and bad) the conduct of the study and results?	Do the researchers occupy dual roles (clinician and researcher)? Are the ethics of this discussed? Do the researcher(s) critically examine their own influence on the formulation of the research question, data collection, and interpretation?	6 7 18	81-83 88-93, 101-116, 370-375
<i>Ethics</i>			
Was informed consent sought and granted?	Informed consent process explicitly and clearly detailed	5-6 6 8	72-74 93-96 120-121
Were participants' anonymity and confidentiality ensured?	Anonymity and confidentiality discussed	5,6 8	72-74 138-140
Was approval from an appropriate ethics committee received	Ethics approval cited	5	69-70

ASK THIS OF THE MANUSCRIPT	THIS SHOULD BE INCLUDED IN THE MANUSCRIPT	Page no.*	Line no.*
S Soundness of interpretive approach			
<i>Analysis</i>			
<p>Is the type of analysis appropriate for the type of study?</p> <ul style="list-style-type: none"> <li>• <i>thematic</i>: exploratory, descriptive, hypothesis generating</li> <li>• <i>framework</i>: e.g., policy</li> <li>• <i>constant comparison/grounded theory</i>: theory generating, analytical</li> </ul>	Analytic approach described in depth and justified	7	101-116
Are the interpretations clearly presented and adequately supported by the evidence?	<i>Indicators of quality</i> : Description of how themes were derived from the data (inductive or deductive) Evidence of alternative explanations being sought Analysis and presentation of negative or deviant cases Description of the basis on which quotes were chosen Semi-quantification when appropriate Illumination of context and/or meaning, richly detailed	7 8 8-15	108-110 138-140 141-290
Was trustworthiness/reliability of the data and interpretations checked?	Method of reliability check described and justified e.g., was an audit trail, triangulation, or member checking employed? Did an independent analyst review data and contest themes? How were disagreements resolved?	6-7 7	96-98 101-116
<i>Discussion and presentation</i>			
Are findings sufficiently grounded in a theoretical or conceptual framework? Is adequate account taken of previous knowledge and how the findings add?	Findings presented with reference to existing theoretical and empirical literature, and how they contribute	15-18	303-366

ASK THIS OF THE MANUSCRIPT	THIS SHOULD BE INCLUDED IN THE MANUSCRIPT	Page no.*	Line no.*
Are the limitations thoughtfully considered?	Strengths and limitations explicitly described and discussed	18-19	367-391
Is the manuscript well written and accessible?	Evidence of following guidelines (format, word count) Detail of methods or additional quotes contained in appendix Written for a health sciences audience	All	All
Are red flags present? These are common features of ill-conceived or poorly executed qualitative studies, are a cause for concern, and must be viewed critically. They might be fatal flaws, or they may result from lack of detail or clarity.	Grounded theory: not a simple content analysis but a complex, sociological, theory generating approach Jargon: descriptions that are trite, pat or jargon filled should be viewed sceptically Over interpretation: interpretation must be grounded in "accounts" and semi-quantified if possible or appropriate Seems anecdotal, self-evident: may be a superficial analysis, not rooted in conceptual framework or linked to previous knowledge, and lacking depth Consent process thinly discussed: may not have met ethics requirements Doctor-researcher: consider the ethical implications for patients and the bias in data collection and interpretation	N/A	N/A

\*Page numbers and line numbers indicated here are as per the accepted manuscript for this study.

## **Chapter 6 Appendices**



**Table S6-1** Standards for Reporting Qualitative Research (SRQR) checklist for study exploring dietetics practice educators' experiences

No	Item	Page/line no(s).*
<b>Title and abstract</b>		
1	<b>Title</b> - Concise description of the nature and topic of the study Identifying the study as qualitative or indicating the approach (e.g., ethnography, grounded theory) or data collection methods (e.g., interview, focus group) is recommended	Title page
2	<b>Abstract</b> - Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions	Abstract P: 1
<b>Introduction</b>		
3	<b>Problem formulation</b> - Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement	P: 2-3 L: 17-42
4	<b>Purpose or research question</b> - Purpose of the study and specific objectives or questions	P: 3 L: 43-51
<b>Methods</b>		
5	<b>Qualitative approach and research paradigm</b> - Qualitative approach (e.g., ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g., postpositivist, constructivist/interpretivist) is also recommended; rationale	P: 4 L: 54-56
6	<b>Researcher characteristics and reflexivity</b> - Researchers' characteristics that may influence the research, including personal attributes, qualifications/experience, relationship with participants, assumptions, and/or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results, and/or transferability	P: 4 L: 58-65
7	<b>Context</b> - Setting/site and salient contextual factors; rationale	P: 5 L: 94-97
8	<b>Sampling strategy</b> - How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale	P: 4-5 L: 67-83
9	<b>Ethical issues pertaining to human subjects</b> - Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues	P: 4 L: 57-58
10	<b>Data collection methods</b> - Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale	P: 5 L: 85-99
11	<b>Data collection instruments and technologies</b> - Description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study	P: 5 L: 85-99

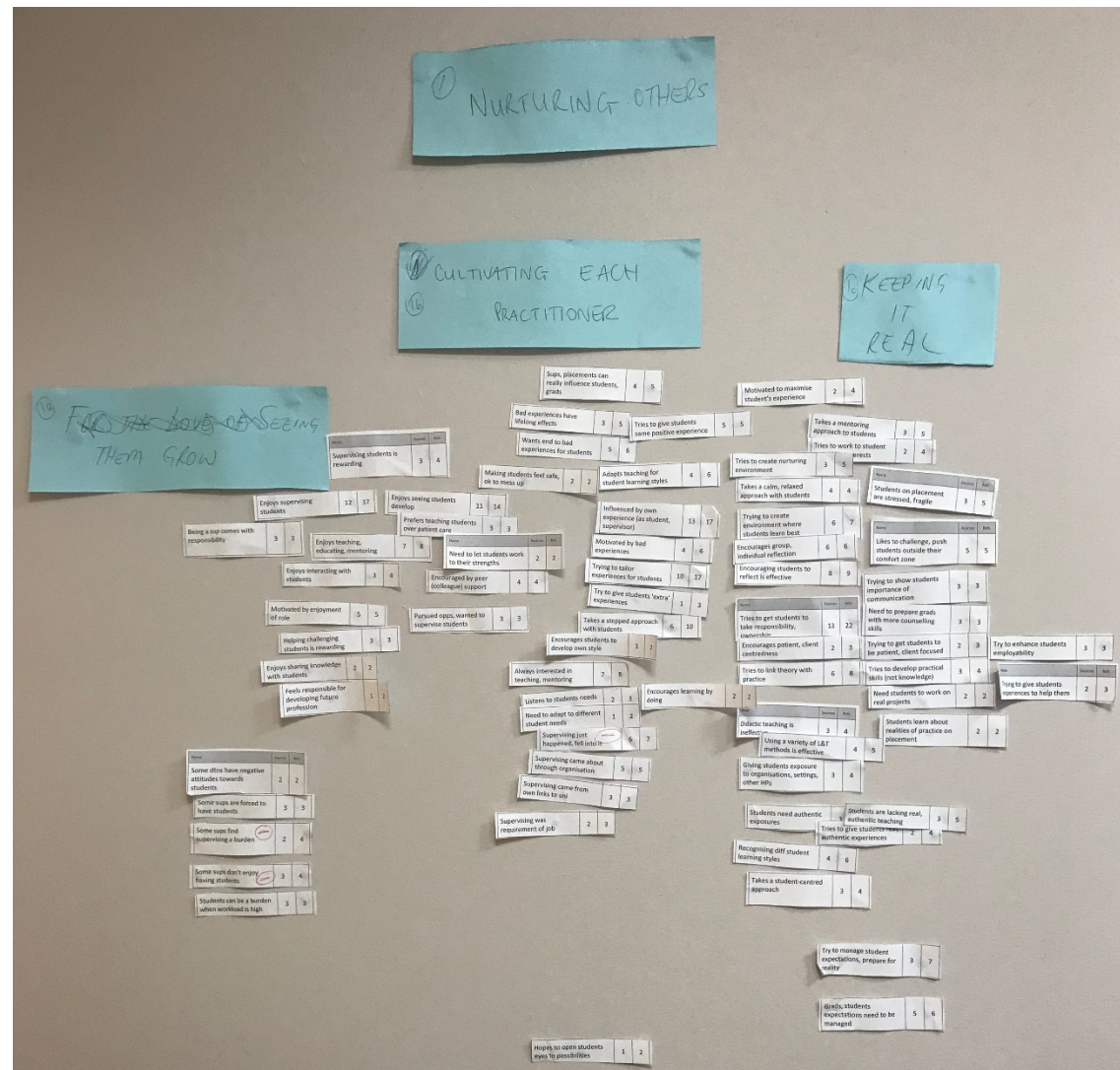
No	Item	Page/line no(s).*
12	<b>Units of study</b> - Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)	P: 7 L: 123-133 Table S1
13	<b>Data processing</b> - Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymization/de-identification of excerpts	P: 5-6 L: 97-106
14	<b>Data analysis</b> - Process by which inferences, themes, etc., were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale	P: 6 L: 101-121
15	<b>Techniques to enhance trustworthiness</b> - Techniques to enhance trustworthiness and credibility of data analysis (e.g., member checking, audit trail, triangulation); rationale	P: 6 L: 101-121 P: 17-18 L: 373-395
<b>Results/findings</b>		
16	<b>Synthesis and interpretation</b> - Main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory	P: 7-13 L: 134-289
17	<b>Links to empirical data</b> - Evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings	P: 7 L: 136-137 Table 2
<b>Discussion</b>		
18	<b>Integration with prior work, implications, transferability, and contribution(s) to the field</b> - Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/generalizability; identification of unique contribution(s) to scholarship in a discipline or field	P: 14-18 L: 292-404
19	<b>Limitations</b> - Trustworthiness and limitations of findings	P: 17-18 L: 373-395
<b>Other</b>		
20	<b>Conflicts of interest</b> - Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed	Title page
21	<b>Funding</b> - Sources of funding and other support; role of funders in data collection, interpretation, and reporting	Title page

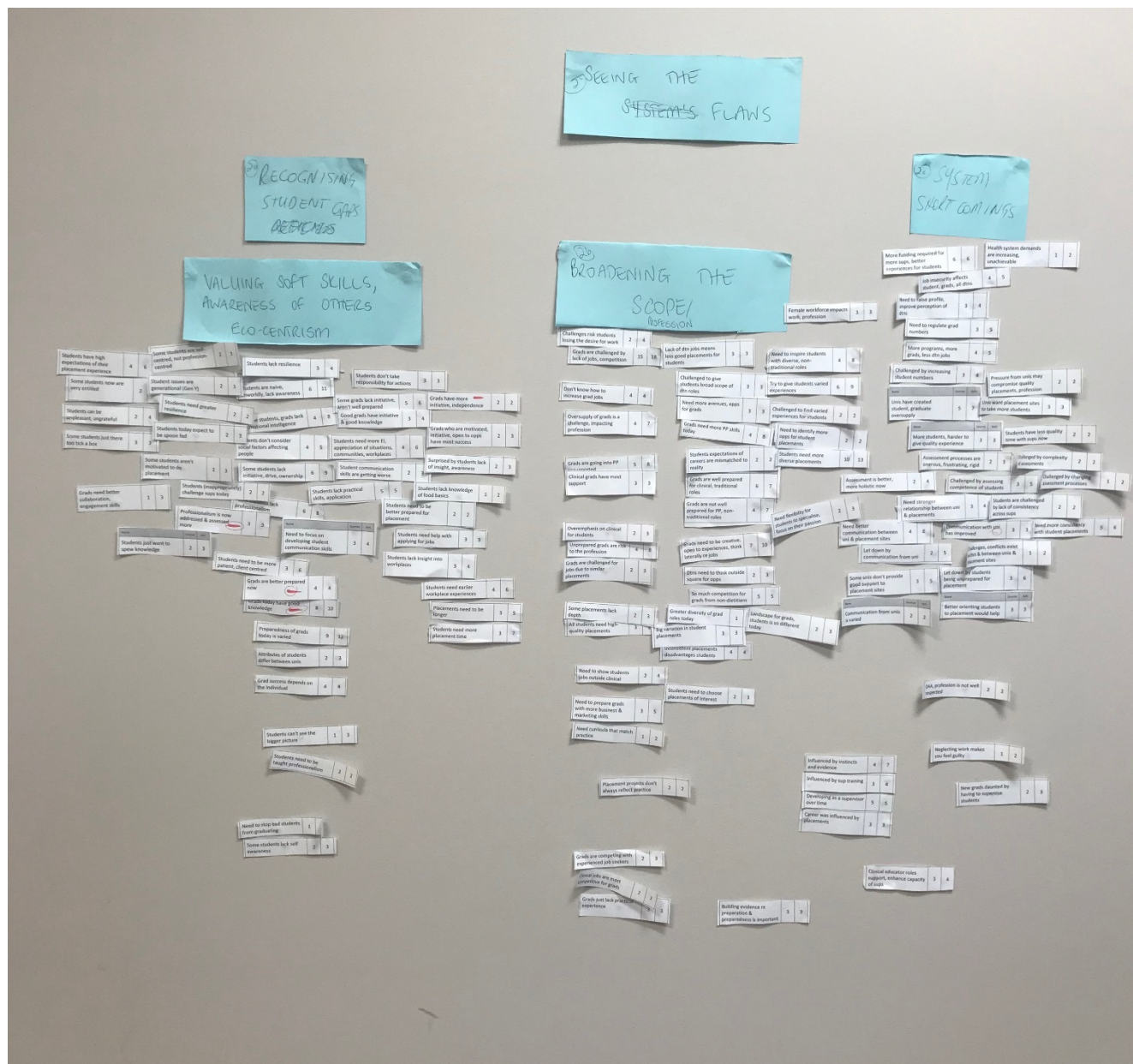
\*Page numbers and line numbers indicated here are as per the accepted manuscript for this study.

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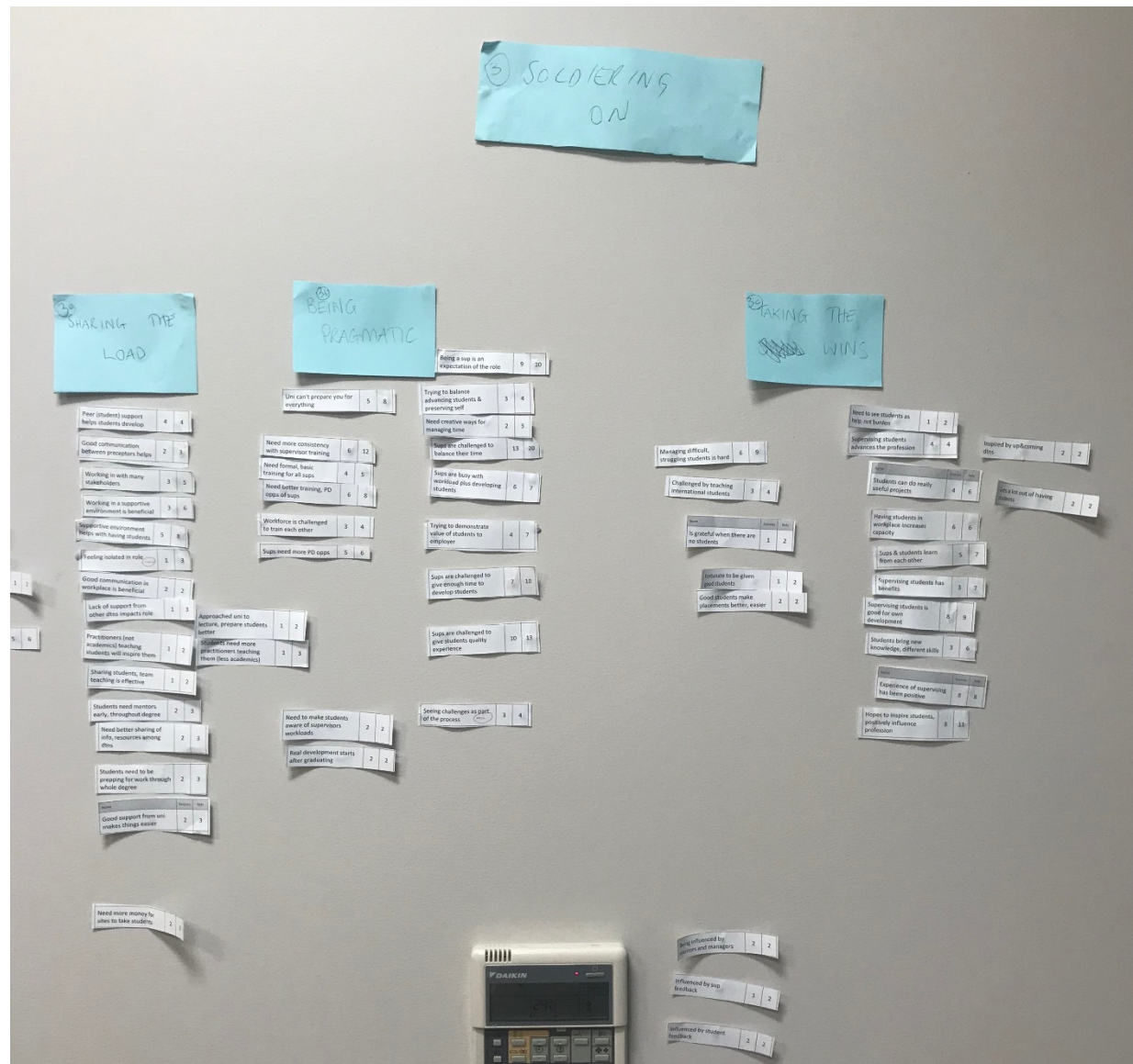
O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. Standards for reporting qualitative research: a synthesis of recommendations. *Acad Med*. 2014; 89(9):1245-1251  
DOI: 10.1097/ACM.0000000000000388

**Figure S6-1** Thematic map developed through data analysis of dietetics practice educators' experiences









**Table S6-2** Professional attributes of dietetics practice educators (n=18) who shared their experiences of preparing dietitians for the workforce

<i>Attribute</i>	<i>Number of participants n (%)</i>
Gender	
Female	18 (100)
Age range (years)	
20-29	3 (16.7)
30-39	8 (44.4)
40-49	4 (22.2)
50-59	3 (16.7)
Current APD <sup>(a)</sup> status	
APD	15 (83.3)
Not an APD	3 (16.7)
Highest level of educational qualification	
Bachelor degree	6 (33.3)
Bachelor degree (Honours), Graduate Certificate, Graduate Diploma	5 (27.8)
Masters degree, Masters degree (Honours)	7 (38.9)
State/territory of employment	
Australian Capital Territory	1 (5.6)
New South Wales	2 (11.1)
Queensland	4 (22.2)
South Australia	3 (16.7)
Victoria	5 (27.8)
Western Australia	3 (16.7)
Appointment fraction (FTE <sup>(b)</sup> ) with workplace	
1.0 FTE	13 (72.2)
0.9 FTE	1 (5.6)
0.6 FTE	1 (5.6)
0.5 FTE	2 (11.1)
0.4 FTE	1 (5.6)
Proportion of time allocated to training students	
100%	1 (5.6)
80%	2 (11.1)
50%	1 (5.6)
40%	1 (5.6)
30%	3 (16.7)
10%	7 (38.9)
5%	3 (16.7)
Years since graduating as a qualified dietitian	
1-5	2 (11.1)
6-10	7 (38.9)
11-15	3 (16.7)
21-25	2 (11.1)
26-30	2 (11.1)
30+	2 (11.1)

**Table S6-2** (continued)

Years of experience working as a dietetics practice educator	
1-5	6 (33.3)
6-10	8 (44.4)
16-20	2 (11.1)
21-25	1 (5.6)
26-30	1 (5.6)
Main area of work as a dietetics practice educator	
Individual patient care <sup>(c)</sup>	6 (33.3)
Public health nutrition <sup>(d)</sup>	6 (33.3)
Individual patient care + food systems management	3 (16.7)
Individual patient care + public health nutrition	2 (11.1)
Public health nutrition + food systems management	1 (5.6)
Years of experience working as a dietitian	
1-5	2 (11.1)
6-10	7 (38.9)
11-15	4 (22.2)
21-25	1 (5.6)
26-30	3 (16.7)
30+	1 (5.6)
Main area of work as a dietitian	
Individual patient care	11 (61.1)
Public health nutrition	5 (27.8)
Individual patient care + public health nutrition	1 (5.6)
Other	1 (5.6)
Level of dietetics programme/s mostly trained students from	
Undergraduate	4 (22.2)
Postgraduate	5 (27.8)
Undergraduate and postgraduate	9 (50.0)
Level of dietetics programme/s currently training students from	
Undergraduate	5 (27.8)
Postgraduate	9 (50.0)
Undergraduate and postgraduate	4 (22.2)

(a) APD = Accredited Practising Dietitian; (b) FTE = full-time equivalent; (c) individual patient care includes clinical dietetics and private practice; (d) public health nutrition includes community nutrition.

## **Chapter 7 Appendices**



**Table S7-1** Standards for Reporting Qualitative Research (SRQR) checklist for study exploring dietetics graduates' experiences

No	Item	Page/line no(s).*
<b>Title and abstract</b>		
1	<b>Title</b> - Concise description of the nature and topic of the study Identifying the study as qualitative or indicating the approach (e.g., ethnography, grounded theory) or data collection methods (e.g., interview, focus group) is recommended	Title page
2	<b>Abstract</b> - Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions	Abstract
<b>Introduction</b>		
3	<b>Problem formulation</b> - Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement	P: 3-5 L: 38-98
4	<b>Purpose or research question</b> - Purpose of the study and specific objectives or questions	P: 5 L: 98-100
<b>Methods</b>		
5	<b>Qualitative approach and research paradigm</b> - Qualitative approach (e.g., ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g., postpositivist, constructivist/interpretivist) is also recommended; rationale	P: 6 L: 104-115
6	<b>Researcher characteristics and reflexivity</b> - Researchers' characteristics that may influence the research, including personal attributes, qualifications/experience, relationship with participants, assumptions, and/or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results, and/or transferability	P: 6 L: 116-125
7	<b>Context</b> - Setting/site and salient contextual factors; rationale	P: 8 L: 160-163
8	<b>Sampling strategy</b> - How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale	P: 7 L: 127-145
9	<b>Ethical issues pertaining to human subjects</b> - Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues	P: 6 L: 124-125
10	<b>Data collection methods</b> - Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale	P: 7-8 L: 147-168
11	<b>Data collection instruments and technologies</b> - Description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study	P: 7-8 L: 147-168 Table 1

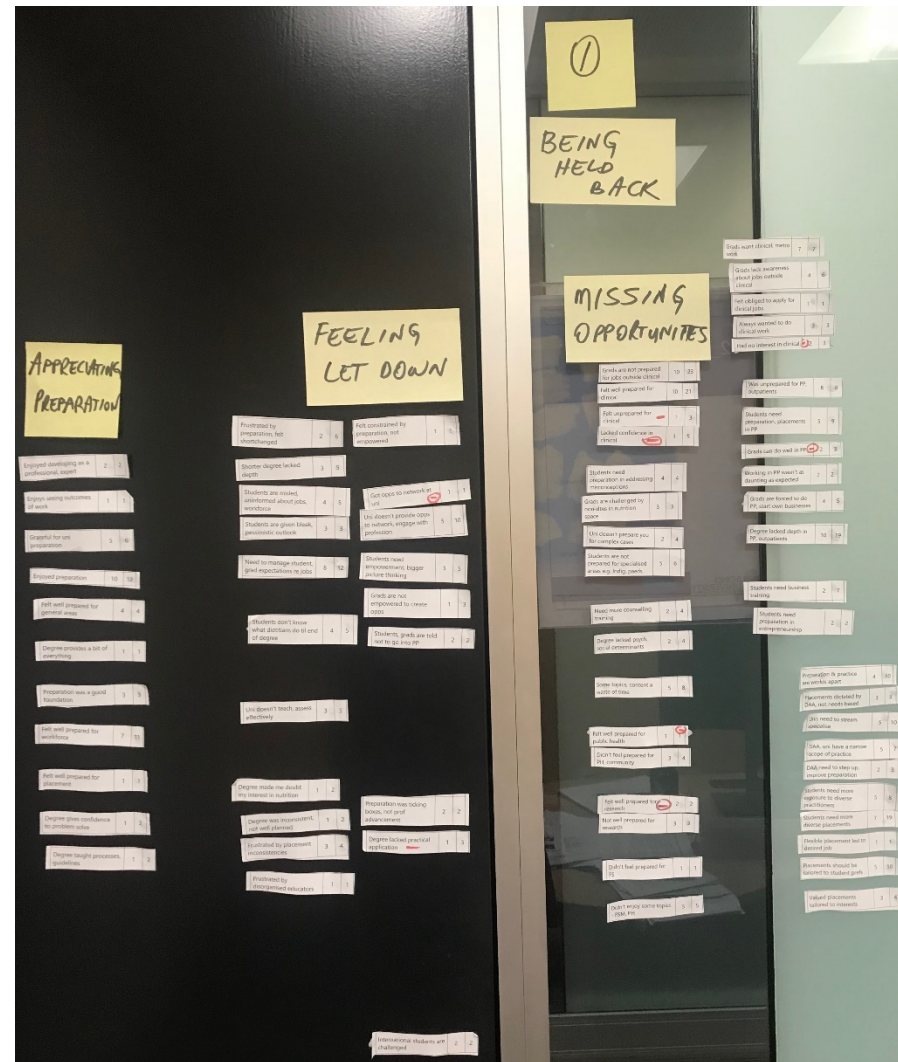
No	Item	Page/line no(s).*
12	<b>Units of study</b> - Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)	P: 8 L: 156-158 Table 2
13	<b>Data processing</b> - Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymization/de-identification of excerpts	P: 8 L: 164-168
14	<b>Data analysis</b> - Process by which inferences, themes, etc., were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale	P: 8-9 L: 170-202
15	<b>Techniques to enhance trustworthiness</b> - Techniques to enhance trustworthiness and credibility of data analysis (e.g., member checking, audit trail, triangulation); rationale	P: 6-10 L: 104-202 P: 24-25 L: 524-548
<b>Results/findings</b>		
16	<b>Synthesis and interpretation</b> - Main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory	P: 11-19 L: 204-405
17	<b>Links to empirical data</b> - Evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings	Table 3
<b>Discussion</b>		
18	<b>Integration with prior work, implications, transferability, and contribution(s) to the field</b> - Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/generalizability; identification of unique contribution(s) to scholarship in a discipline or field	P: 20-24 L: 407-521
19	<b>Limitations</b> - Trustworthiness and limitations of findings	P: 24-25 L: 524-548
<b>Other</b>		
20	<b>Conflicts of interest</b> - Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed	Title page
21	<b>Funding</b> - Sources of funding and other support; role of funders in data collection, interpretation, and reporting	Title page

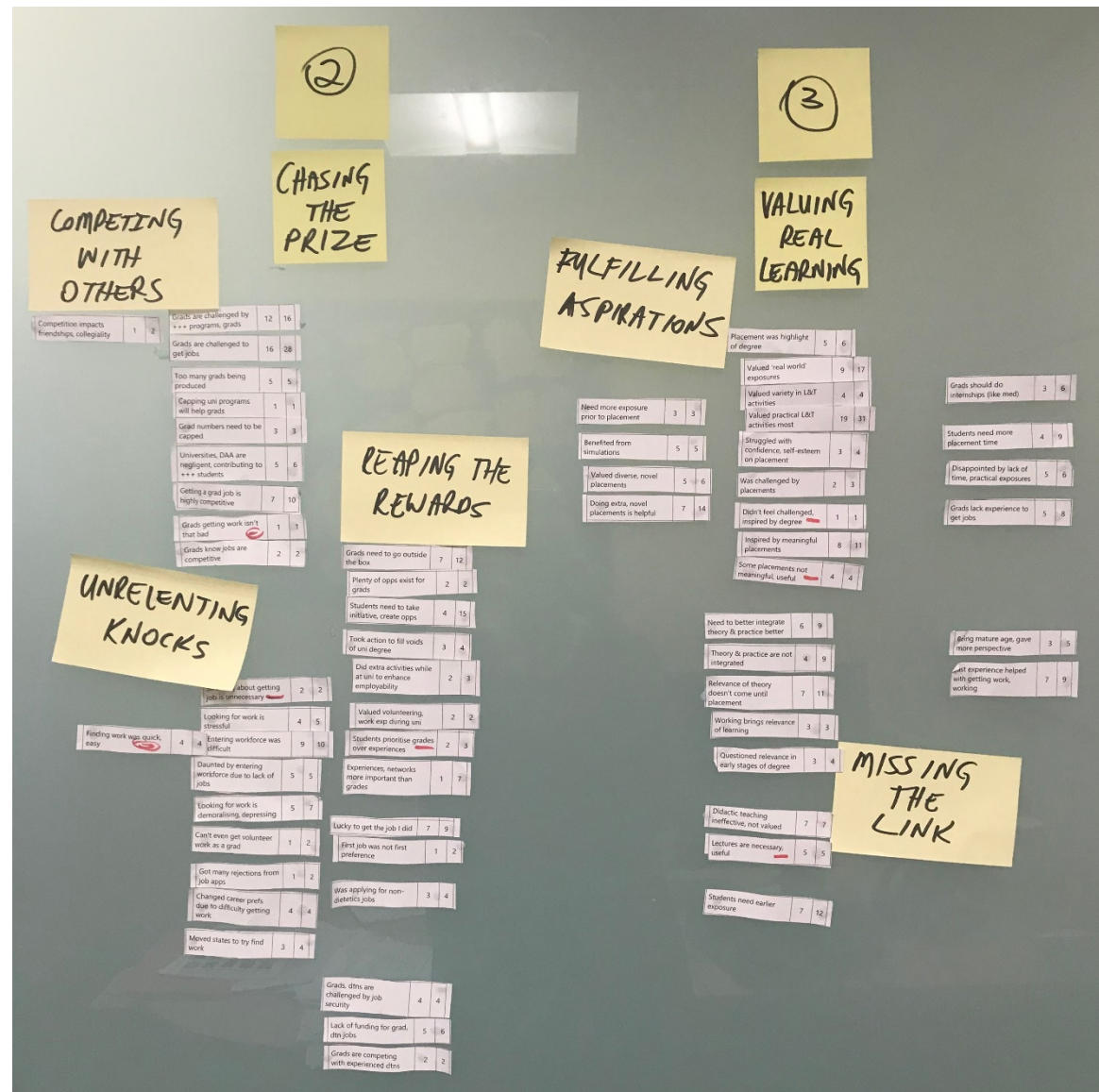
\*Page numbers and line numbers indicated here are as per the accepted manuscript for this study.

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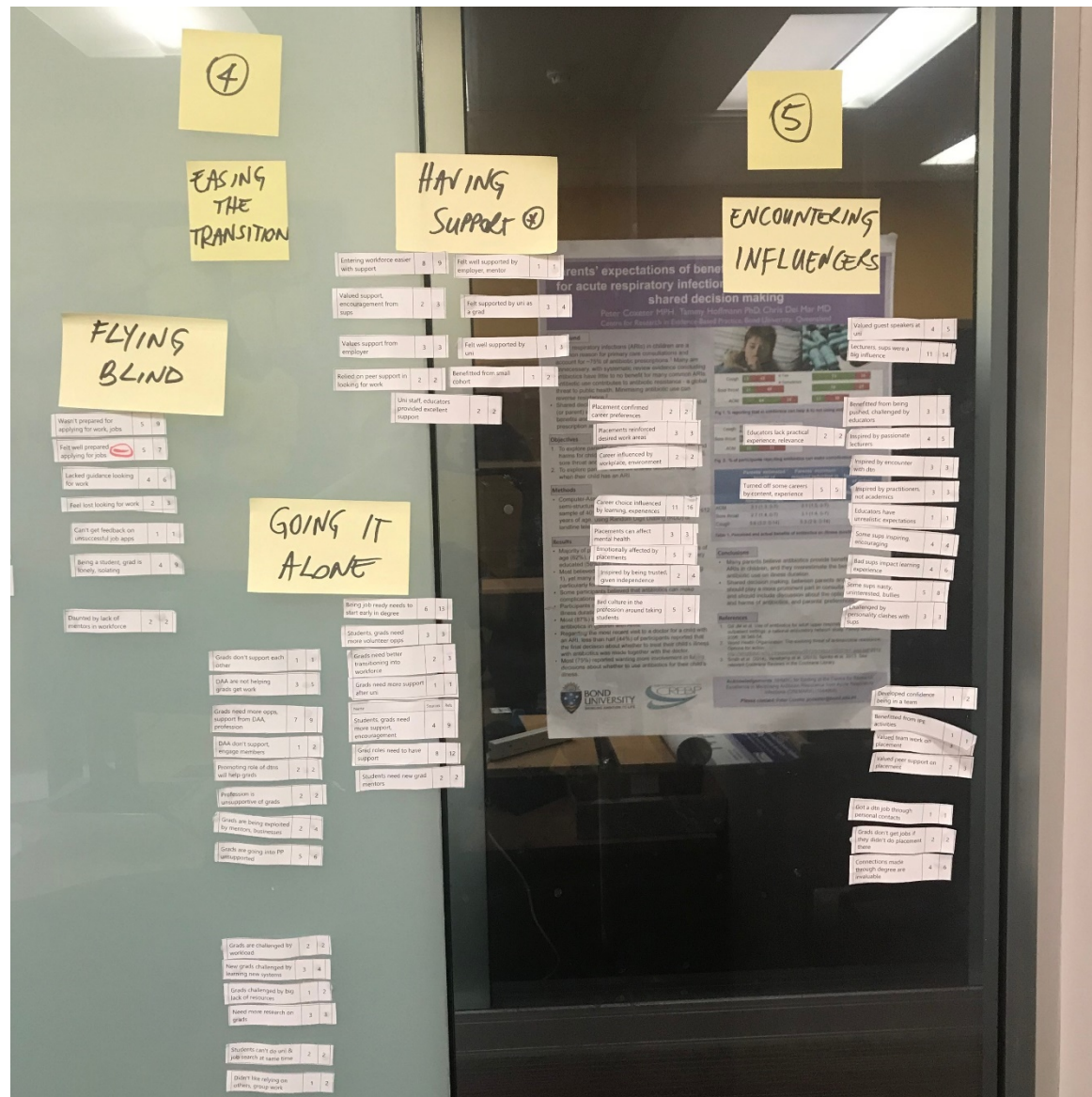
O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. Standards for reporting qualitative research: a synthesis of recommendations. *Academic Medicine*. 2014; 89(9):1245-1251  
DOI: 10.1097/ACM.0000000000000388

**Figure S7-1** Thematic map developed through data analysis of recent dietetics graduates' experiences









## **Chapter 8 Appendices**

**Table S8-1** Enhancing transparency in reporting the synthesis of qualitative (ENTREQ) research guidelines used for qualitative synthesis of dietetics students' experiences study

No.	Item	Description	Page No.*	Line No.*
1	Aim	State the research question the synthesis addresses	1 4-5	4-5 76-78
2	Synthesis methodology	Identify the synthesis methodology or theoretical framework which underpins the synthesis, and describe the rationale for choice of methodology ( <i>e.g. meta-ethnography, thematic synthesis, critical interpretive synthesis, grounded theory synthesis, realist synthesis, meta-aggregation, meta-study, framework synthesis</i> )	7	138-140
3	Approach to searching	Indicate whether the search was pre-planned (comprehensive search strategies to seek all available studies) or iterative (to seek all available concepts until theoretical saturation is achieved).	5	89
4	Inclusion criteria	Specify the inclusion/exclusion criteria ( <i>e.g. in terms of population, language, year limits, type of publication, study type</i> )	5-6	100-113
5	Data sources	Describe the information sources used (e.g. electronic databases (MEDLINE, EMBASE, CINAHL, psycINFO, Econlit), grey literature databases (digital thesis, policy reports), relevant organisational websites, experts, information specialists, generic web searches (Google Scholar, hand searching, reference lists) and when the searches conducted; provide the rationale for using the data sources.	6	106-109
6	Electronic search strategy	Describe the literature search ( <i>e.g. provide electronic search strategies with population terms, clinical or health topic terms, experiential or social phenomena related terms, filters for qualitative research, &amp; search limits</i> ).	5	89-97
7	Study screening methods	Describe the process of study screening and sifting ( <i>e.g. title, abstract and full text review, number of independent reviewers who screened studies</i> ).	6	116-125
8	Study characteristics	Present the characteristics of the included studies ( <i>e.g. year of publication, country, population, number of participants, data collection, methodology, analysis, research questions</i> ).	9	177-187
9	Study selection results	Identify the number of studies screened and provide reasons for study exclusion ( <i>e.g. for comprehensive searching, provide numbers of studies screened and reasons for exclusion indicated in a figure/flowchart; for iterative searching describe reasons for study exclusion and inclusion based on modifications to the research question and/or contribution to theory development</i> ).	Fig 1	1
10	Rationale for appraisal	Describe the rationale and approach used to appraise the included studies or selected findings ( <i>e.g. assessment of conduct (validity and robustness), assessment of reporting (transparency), assessment of content and utility of the findings</i> ).	8	162-164
11	Appraisal items	State the tools, frameworks and criteria used to appraise the studies or selected findings ( <i>e.g. Existing tools: CASP, QARI, COREQ, Mays and Pope; reviewer developed tools; describe the domains assessed: research team, study design, data analysis and interpretations, reporting</i> ).	8	162-164
12	Appraisal process	Indicate whether the appraisal was conducted independently by more than one reviewer and if consensus was required.	8	162-172

No.	Item	Description	Page No.*	Line No.*
13	Appraisal results	Present results of the quality assessment and indicate which articles, if any, were weighted/excluded based on the assessment and give the rationale.	9	190-198
14	Data extraction	Indicate which sections of the primary studies were analysed and how were the data extracted from the primary studies? <i>(e.g. all text under the headings “results /conclusions” were extracted electronically and entered into a computer software).</i>	7	128-135
15	Software	State the computer software used, if any.	6 7	117 132
16	Number of reviewers	Identify who was involved in coding and analysis.	7	140-151
17	Coding	Describe the process for coding of data <i>(e.g. line by line coding to search for concepts).</i>	7	142-144
18	Study comparison	Describe how were comparisons made within and across studies <i>(e.g. subsequent studies were coded into pre-existing concepts, and new concepts were created when deemed necessary).</i>	7	144-146
19	Derivation of themes	Explain whether the process of deriving the themes or constructs was inductive or deductive.	7	146-147
20	Quotations	Provide quotations from the primary studies to illustrate themes/constructs, and identify whether the quotations were participant quotations of the author’s interpretation	10	205-207 Table 4
21	Synthesis output	Present rich, compelling and useful results that go beyond a summary of the primary studies <i>(e.g. new interpretation, models of evidence, conceptual models, analytical framework, development of a new theory or construct).</i>	10-16	209-368

\*Page numbers and line numbers indicated here are as per the accepted manuscript for this study.



**Table S8-2** Full search strategy for identifying qualitative studies regarding students' experiences of dietetics workforce preparation

<b>Medline</b>
(Dietetic*.mp. or exp Dietetics/ or dietician*.mp. or dietitian*.mp.) and (student*.mp. or exp Students/ or graduate*.mp. or intern*.mp. or educator*.mp. or teacher*.mp. or exp Teaching/ or academic*.mp. or lecturer*.mp. or supervisor*.mp. or preceptor*.mp.) and ((Workforce or prepar* or readiness or practice or education*).mp. or exp Education/ or training.mp. or placement*.mp. or internship*.mp. or clinic*.mp. or assess*.mp. or universit*.mp. or college*.mp. or curricul*.mp.) and ((Interview* or focus group* or observation* or survey* or questionnaire* or case study or thematic or qualitative).mp. or exp Qualitative Research/) [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
<b>CINAHL</b>
( Dietetic* OR (MH "Dietetics") OR dietician* OR dietitian* ) AND ( student* OR graduate* OR intern* OR educator* OR teacher* OR academic* OR lecturer* OR supervisor* OR preceptor* ) AND ( Workforce OR prepar* OR readiness OR practice OR education* OR (MH "Education+") OR training OR placement* OR internship* OR clinic* OR assess* OR universit* OR college* OR curricul* ) AND ( Interview* OR focus group* OR observation* OR survey* OR questionnaire* OR case study OR (MH "Audiorecording") OR thematic OR qualitative OR qualitative stud\$ OR (MH "Qualitative Studies+") )
<b>EMBASE</b>
dietetic*:ti,ab OR dietician*:ti,ab OR dietitian*:ti,ab OR 'dietetics'/exp AND (student*:ti,ab OR graduate*:ti,ab OR intern*:ti,ab OR educator*:ti,ab OR teacher*:ti,ab OR academic*:ti,ab OR lecturer*:ti,ab OR supervisor*:ti,ab OR preceptor*:ti,ab) AND (workforce:ti,ab OR prepar*:ti,ab OR readiness:ti,ab OR practice:ti,ab OR education*:ti,ab OR training:ti,ab OR placement*:ti,ab OR internship*:ti,ab OR clinic*:ti,ab OR assess*:ti,ab OR universit*:ti,ab OR college*:ti,ab OR curricul*:ti,ab OR 'education'/exp) AND (interview*:ti,ab OR focus:ti,ab AND group*:ti,ab OR observation*:ti,ab OR survey*:ti,ab OR questionnaire*:ti,ab OR case:ti,ab AND study:ti,ab OR thematic:ti,ab OR qualitative:ti,ab OR 'qualitative research'/exp)
<b>ERIC</b>
( Dietetic* OR (DE "Dietetics") OR dietician* OR dietitian* ) AND ( student* OR graduate* OR educator* OR intern* OR teacher* OR academic* OR lecturer* OR supervisor* OR preceptor* ) AND ( Workforce OR prepar* OR readiness OR practice OR education* OR training OR placement* OR internship* OR clinic* OR assess* OR university* OR college* OR curricul* ) AND ( Interview* OR focus group* OR observation* OR survey* OR questionnaire* OR case study OR thematic OR qualitative OR (DE "Qualitative Research") )
<b>PsycInfo</b>
(Dietetic*.mp. or exp Dietetics/ or dietician*.mp. or dietitian*.mp.) and (student*.mp. or exp Students/ or graduate*.mp. or educator*.mp. or intern*.mp. or teacher*.mp. or exp Teaching/ or academic*.mp. or lecturer*.mp. or supervisor*.mp. or preceptor*.mp.) and ((Workforce or prepar* or readiness or practice or education*).mp. or exp Education/ or training.mp. or placement*.mp. or internship*.mp. or clinic*.mp. or assess*.mp. or universit*.mp. or college*.mp. or curricul*.mp.) and ((Interview* or focus group* or observation* or survey* or questionnaire* or case study or thematic or qualitative).mp. or exp Qualitative Research/) [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]

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**Informat**

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((Dietetic\* OR dietician\* OR dietitian\*)) AND ((student\* OR graduate\* OR educator\* OR intern\* OR teacher\* OR academic\* OR lecturer\* OR supervisor\* OR preceptor\*)) AND ((Workforce OR prepar\* OR readiness OR practice OR education\* OR training OR placement\* OR internship\* OR clinic\* OR assess\* OR universit\* OR college\* OR curricul\*)) AND ((Interview\* OR focus group\* OR observation\* OR survey\* OR questionnaire\* OR case study OR thematic OR qualitative))

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**Table S8-3.** Journals hand searched from July to December 2017 to identify qualitative studies regarding students' experiences of dietetics workforce preparation

Journal name	Country of origin
Canadian Journal of Dietetic Practice and Research	Canada
Journal of the Academy of Nutrition and Dietetics	United States
Journal of Human Nutrition and Dietetics	United Kingdom
Nutrition & Dietetics	Australia

**Figure S8-1** Thematic map developed through data analysis of dietetics students' experiences

